STUDIES IN ARABIC AND PERSIAN MEDICAL LITERATURE

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I DEDICATE *this little book with all respect and in all humility to the revered memory of my father,* Ḥáfiẓ Hakím Maulawí Muḥammad Isḥáq, *a learned and reputed physician of Patna. He practised the healing art with great success for half a century. His saintly character and deep sympathy for his patients, commanded the respect of everyone who came in touch with him. His grave at Patna is the visiting place for a large number of people even today. To him I owed everything when he lived and to his inspiring memory are due all my humble achievements ever since his death.*

هرجا که ز پای تو غباریست
مارا ز بهشت یادگاریست

(خسرو)

Wherever there is a trace of the dust
raised by your foot,
It is for us a souvenir from Paradise.

FOREWORD

BY

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The history of the development of the science of medicine is interesting as well as instructive. Its importance has been realised since the beginning of the present century. Its historical, scientific and educational values have been emphasised by medical men and institutions. More than a score of professorships, in addition to numerous lectureships, have been established in the universities and medical institutions of Europe and America. Societies and clubs devoted to the study of the subject have been started. Several journals dealing with the history of medicine, are regularly published. The volume of *Index Medicus* has largely increased in recent times which shows how actively medicine is participating in the study of its origins and development and how much we are being influenced by modern historical methods.

Scholars and medical men of India have published the English translations of several ancient medical works and monographs on them. A history of Indian medicine from the earliest period to the modern times containing biographical and bibliographical notices of the ancient Ayurvedic physicians and of their works has been published by Calcutta University. But the interest in the history of medicine in general has not developed in our country. No important work has so far been done either on the general history of the subject or on the contributions of any other country or people to the development of medical science. Dr. Mohammed Zubayr Siddiqi, Professor of Islamic Culture, Calcutta University, is the first Indian scholar to write a short history of the contributions of the Arabic and Persian writers, to the history of medicine.

The contribution of the Arabic and Persian writers of the medieval period, to the development of medical science is

immense. These masters of medicine made many important discoveries in the field of medical science. It is their achievements in this sphere that served as the foundation for its modern developments. Several European Orientalists and historians of science have dealt with them in their works. But so far they have touched only the fringe of the field. In this book Dr. Siddiqi has brought to light many facts which were so far generally unknown. He has described some of the important discoveries of the Arab and Persian masters of medicine, some of the medical institutions, hospitals and colleges, which were established by them in India and other countries. He has fully discussed the earliest Arabic medical compendium which contains a complete description not only of the Greek system of medicine but also of the Indian medicine on the basis of four of the important ancient Indian medical works. He has also described two of the earliest Persian books on medicine, written in India, entirely on the basis of the ancient Indian medical books and has dealt with many other important problems connected with the Arabian and Persian medicine.

Dr. Siddiqi is known to me for more than twenty-five years. He is a 'gentleman-scholar' in the true sense of the term. He is not a medical man. But he has made a thorough study of Arabic and Persian medical literature and his knowledge of the history of medicine in general is fairly wide. He possesses keen critical acumen, is fully conversant with the modern methods of historical and literary research and is a sound scholar of Arabic and Persian literature. His researches in certain field of Arabic literature have been already recognised. Those interested in the history of medicine should feel grateful to him for the present work which is sure to win fresh laurels for him. I commend it for perusal to those interested in the subject and am confident that it will inspire the younger generation to make further researches on it.

B. C. Ray

PREFACE

It is with some diffidence that I present this book to the readers, for I possess few of the necessary qualifications which have been enumerated by Prof. E. G. Browne (*Arabian Medicine*, pp. 112-13) and by Dr. Cyril Elgood (*A Medical History of Persia*, pp. 584-86) for this type of work. I do not know either the Greek Language or the modern medical science, and therefore, I was greatly hampered in identifying Arabic medical terms with their Greek originals, as well as in rendering certain parts of the Arabic and Persian texts into English. The only qualification that I possess for this work, is that I can read Arabic and Persian texts and that I was educated and trained in Arabian medicine in my early life by my father who being a distinguished practitioner of Arabian medicine, was fully conversant with Arabic and Persian medical literature. It was this early training that encouraged me to take up the work and to contribute my little bit towards the compilation of the history of the development of Arabian medicine till the early Abbasid period, so that it may be utilized by scholars, better qualified than I, in determining the rôle of the Arabic and Persian writers on medicine in the evolution of the healing art up to its present stage.

Now it remains my pleasant duty to express my thanks to the University of Calcutta which very kindly agreed to publish the book, and made a special grant for getting the photostat copies of certain articles bearing on its contents and for securing a number of illustrations and preparing their blocks. I must also thank several of my friends who have helped me in this work in various ways. Dr. 'Abdu's-Sattár Ṣiddíqí of Allahabad helped me with many valuable suggestions. Mr. Ṣabáḥu'd-Dín 'Abdu'r-Raḥmán of the Dáru'l-Muṣannifín of A'ẓamgarh lent me several books which were not available in Calcutta. Dr. A. B. M. Ḥabíbullah and Dr. S. Imámu'd-Dín

of the Dacca University supplied me with four of the illustrations, Dr. Yúsufu'd-Dín of the Osmania University of Hyderabad with three of them and Dr. Niẓámu'd-Dín, the Director of the Dá'iratu'l-Ma'árif and Advisor to the Sálár-i-Jang Estate Library with one of them. Professor H. K. Shirwání sent me a note on the historic and beautiful building of the Dáru'sh-Shifá of Hyderabad which, by the way, is now in a dilapidated condition and deserves immediate attention from the Archaeological Department. Mr. 'Aṭá Karím Barq, an industrious scholar and lecturer in Persian at the Calcutta University read the proofs of the whole book and prepared the index. To all of them I feel deeply grateful for their kind help. And last but not least, I must express my thanks to the Calcutta University Press which has fully co-operated with me in solving every difficulty which arose while the book was being printed.

July 8, 1958 M. Z. Ṣiddíqí

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PRELIMINARY DISCOURSE

(based on the *History of Medicine* by M. Neuburger).

The present highly developed but imperfect stage of the science of medicine, has not been reached by the efforts of any particular race or nation. It is the result of the labours of almost all the nations living in the different parts of the world. Every nation has contributed its own little bit towards its development. Its origin has been traced back to the animal stage. The healing processes of cooling, heating, rubbing, massaging, of enemata, of blood letting, the use of the juice of celandine for sore eyes, that of leaves of arum for stomach trouble, that of a variety of origanum and of bitter root of ophiorrhiza as antidotes to snake-bite, of the leaves of dictamnus for the cure of wounds etc., have been traced back to various animals. These and other curative processes were adopted by the primitive man for healing and curing certain injuries and ailments. The primitive man observed these phenomena, and added to them a good deal of the results of his own experience. He used medicinal plants as well as mineral substances in the form of decoctions and cataplasms, powders and pills, poultices and plasters. Some primitive races were also familiar with the use of fumigation, inhalation, snuffs, nasal douching and instillation. Inoculation against small-pox and snake-bite were performed by rubbing the contents of a pustule into an incision in the skin. Venesection was performed on various veins. Even such a difficult and severe operation as trephining of the skull was performed by the primitive man as early as the stone age. Modern research has brought to light skulls on which it was performed thrice. As far as remedies are concerned, these may be sufficiently indicated by the fact that the modern pharmacopoeia owes no small part of its most valuable contents to the aboriginal sources.

When man's mind progressed and his reasoning faculties developed and civilisation advanced, various peoples made their own contributions to the theory and practice of the science of medicine. The Assyrians and the Babylonians considered the disease as something foreign to the body, caused by the "evil spirit", classified it on anatomical and symptomatic basis and introduced many new therapeutic agents. The Egyptians developed hygiene to a very high degree and added more drugs and medicaments to the pharmacopoeia.

The Persians in consequence of their dualistic religious principle held that the disease in its countless manifestations, was the effect of the influence of Ahriman.

The contribution of India to the science of medicine is immense. Its medical literature is rich, varied and of great importance. Its wealth of knowledge and systematic construction must be admired even by a modern medical man. It prescribed a high standard of medical ethics and etiquette, as well as for the qualification necessary for a student of medicine. It put medical education on scientific basis. The course of instruction lasted for six years and included the mastery of the standard medical works as well as the practical training in medicine and surgery under the supervision of a qualified and reputed teacher.

After the completion of the study, permission to practice had to be obtained from the king. The Indians developed the system of prognosis and diagnosis to a very high degree.

Susruta has mentioned 760 medicinal plants. In addition to them animal and mineral substances were also used as medicaments.

In surgery, the attainments of the Indians, which were based entirely on keen observation, rich experience and rational considerations remained unrivalled for many centuries by any other nation. Their most astonishing performances were in the domains of laparotomy, lithotomy and plastic operation.

As a matter of fact the plastic surgery of the nineteenth century was stimulated by the example of Indian methods.

The Indians appeared to have anticipated the principle on which modern system of Homeopathy is based.

To them must also be given the credit for the use of hypnotism in connection with surgical operation. It was not a mere accident that Doctor Esdaile performed many operations in Calcutta under anaesthesia induced by hypnotism.

Under the influence of Buddhism, however, the care for the sick developed greatly and consequently hospitals, homes and pharmacies were established.

The Chinese who must have been greatly influenced by the Indian system of medicine appeared to have made little independent contribution to the medical science excepting by greater development of the pulse lore and by adding a few drugs to the Pharmacopoeia.

In Greece, Hippocrates, one of the greatest medical geniuses of all times, raised medicine to the highest pinnacle of glory and laid the true foundation of all its future development not by making any great discovery either in the field of medicine or in surgery, but by raising the ethical standard and etiquette of the medical profession to the highest degree, by changing the method of enquiry in medical problems from dogmatic, speculative and deductive processes to the inductive method based entirely on observation of facts and their actual experience.

According to him "The high ethical view of the medical calling is the incentive to the most laborious study, the most accurate clinical observation and the most conscientious treatment."

He made medicine free from the influence of priesthood and of theurgy as well as from dogmatic and unfounded speculation and presumption and based his enquiries entirely on observation of facts and actual experience of clinical cases. He gave due

credit to all his predecessors in the field of medicine for their valuable achievements, but eliminated such of their theories as were based on mere assertion or unwarranted deduction. He attached greater importance to the clinical history of every case than to general pathological principles. He focussed his mind more on the sick than on the sickness, more on prognosis than on diagnosis. He did not follow rigidly either causal or symptomatic line of treatment but applied to every individual case what suited it best. In his therapy he depended mainly on the natural healing powers of the individual patient, helping them with suitable diet and also with medicine when necessary.

About three centuries after Hippocrates there appeared in the field of medicine the great genius of Galen with commanding talents, immense power of combination and matchless diligence. He unified in one complete system the attainments of his predecessors in the various branches of medical science adding to them a good deal of his own achievements. But in doing so he combined the Hippocritic inductive method of enquiry with that of deductive process based on mere plausible assumption.

He made a life-long study of anatomy, corrected many errors of his predecessors in this field, and added to it a good deal of his own discoveries. He achieved excellent results in certain branches of physiology, particularly in that of brain and spinal cord. But many of the results achieved by him were erroneous. He made an important contribution to Pathology by recognising the significance of a transitional state, preliminary to the onset of sickness. His writings show his great insight in special Pathology also. In therapeutics he generally follows empirical methods instead of dogmatic principles. He recognised the importance of the healing power of nature and accepted the dictum of Hippocrates that "do good and at least do no harm".

In the use of medicaments he was at times guided by clinical experience but generally he followed the deductive and speculative principle.

In Hygiene he was a faithful follower of Hippocrates. He attained all that was possible, in systematising all the various branches into one organic whole, though it was based more on brilliant fiction than on solid facts.

The Arabs who began their scientific activity with fresh energy, in the 8th century of the Christian Era continued it with unabated vigour for about a thousand years, had inherited the attainments of all the previous nations in the fields of various sciences in general and of medicine in particular. The important centres of their scientific activities were situated in Mesopotamia and in Spain. They collected the works of the Greeks, of the Indians and of the other nations, on medicine, and got them translated into their own language with the help of the masters of the science belonging to different nationalities. They soon started their own independent investigations in the fields of various sciences in general and of medicine in particular. The results had been extremely valuable. In this book a modest attempt has been made to give a short account of their achievements.

INTRODUCTION

Importance of Arabian Medicine

Preservation of Ancient Medicine.

Arabian Medical literature has played an important part in the history of the healing art. It preserved the medical attainments of the Greeks and the Indians, added to them the results of the medical experiences of the various nations like the Egyptians, the Persians and the Chinese, with which it came in contact during its long history of one thousand years, laid the foundation of the principles of Induction and Inductive Methods and stressed upon their application to medical science.

Application of inductive methods

Some of the devotees of Arabian Medicine applied these methods to medical and clinical cases and made observation and experience the basis of their theories and thereby made important concrete contribution to medical science. Their patrons, the Muslim Caliphs and Sultans, under whose liberal patronage and fostering care these medical men belonging to different nations and communities worked, carried the results of their labours to the countries which they conquered and founded numerous medical institutions, colleges, hospitals and homes, for its cultivation and practice, for the relief of the sick and suffering people of all classes. The Arabian Medical practitioners collected and preserved the results of their experiences of clinical cases which they minutely observed and treated either in the hospitals or in private practice. They generally and ar-Rází particularly, have often referred to these cases in the al-*Ḥáwí*, the *Kitábu'l-Fákhir* and other works. Arabian Medicine thus developed, is followed and practised in a large part of the world from Algeria to India and serves as a source

of medical relief to the suffering people in these countries till today.

I

Independent Contributions of Arabian Medical Men to the Medical Science

Their independent contributions.

In Chapter VIII of this book, I have pointed out some of the basic principles which, according to the Arabic medical writers, should form the basis of medical theories. But their unshakable confidence in Greek writers and certain theological beliefs stood in their way of making full use of these principles. Still they could not shut their eyes towards the facts which they observed, and they did not fail to correct some of the inaccuracies which persisted till their time and to make important independent contribution to the medical science on the basis of their own experiences. Some of the contributions of these writers to the various branches of Medical Science are given below :—

Anatomy :

1. 'Abdu'l-Laṭíf al-Baghdádí (1162-1231) pointed out that Galen was in error when he stated that the lower jaw consisted of more than one piece and went so far as to observe that human anatomy could be better understood by the minute observation of human body than by reading the works of Galen and the Greek writers.[1]

2. Some of them pointed out that the skull consisted of eight bones and not of seven as Galen thought.[2]

3. Some of them observed that there were three ossicles in the ear which were responsible for the sense of hearing.[3]

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[1] Elgood, *A Medical History of Persia*, p. 332.

[2] Ḥakím Md. Kabiruddin, *Some Lesser known Facts about Arabian Medicine*, p. 12.

[3] *Ibid.*, p. 12.

Physiology :

4. Some of them asserted that grape-juice (sugar) was present in the blood (*Sharḥu'l-Asbáb* by Burhánuddín).[1]

5. 'Alí Ḥusayn al-Jílání in his commentary on the *Canon* has observed that blood was always in circulation.[2]

6. An Egyptian physician (Taufíq Susa) has shown that Ibnu'n-Nafís ('Alá'u'd-Din Abúl-'Ala 'Alí b. Abi Ḥazm al-Qurashí al-Dimashqí), an Arab physician of the thirteenth century (607-687, 1210-1288), in his commentary on the anatomy of Avicenna, in striking contrast with him and Galen, described the lesser or pulmonary circulation almost correctly, nearly three centuries before its discovery by William Harvey who is regarded as the father of modern medicine.[3] Dr. J. Blatham of the University of Manchester also has recognised that the basic principles of the modern theory of circulation of blood was originally propounded by the Arab physician Ibnu'n-Nafís, in the thirteenth century.[4]

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[1] Ḥakím Md. Kabiruddin, *Some Lesser known Facts about Arabian Medicine*, p. 11.

[2] *Ibid.*, p. 11.

[3] *Isis*, 1935, Vol. XXIII, pp. 100-120.

[4] The Sunday Times (London) of the 9th June, 1957, reported that Dr. J. Blatham of the University of Manchester wrote in connection with the tercentenary of the death of William Harvey, the discoverer of the fact of the circulation of blood, that Ibnu'n-Nafís, an Arab physician, "had discovered the essential principle of the pulmonary circulation, which he described more or less accurately, almost three centuries before any European." The doctor said that Ibnu'n-Nafís, "recognized the fallacy of Galen's theory of invisible channels between the ventricles and also refuted Avicenna's supposition that there was some visible link between these two chambers. He similarly explained that blood was purified in the lungs, where it was refined on contact with the air inhaled from the outer atmosphere..... It should not be assumed too readily that great discoveries in medicine were made only in Europe" (The Statesman, of Calcutta, the 11th June, 1957).

7. 'Alí 'Abbás has said that there were three layers in the walls of blood vessels.[1]

8. Ḥunayn b. Isḥáq has stated that the structure of the brain was similar to that of the nerves; he has also remarked that all cerebral sensations are really movements.[2]

9. 'Aláu'd-Din al-Qurashí has remarked that the food is the fuel for the maintenance of body-heat This has been greatly developed by the modern Physiologists.[3]

10. Aṭ-Ṭabarí has remarked in his *Firdausul-Ḥikmat* that digestion is in reality a kind of decomposition.[4]

11. Ḥunayn was of opinion that in the stomach there was a sour juice which caused the sensation of hunger.[5]

12. Al-Jílání has referred to the rotary movement of food as well as to the intestinal peristalsis.[6]

13. Abu Sahl al-Masíḥí has pointed out that the absorption of food takes place more through the intestine than through the stomach and he and Avicenna both observed that the process of digestion begins in the mouth where food is acted upon by certain digestive secretions.[7]

Abu Sahl has also given a detailed description of the gastric juice.

14. Abu'l-Faraj has remarked that in the nerves there are canals through which the impulses of sensation and movement pass along the body.[8]

15. Some of them observed that the liver played an important part in the formation of blood.

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[1] Ḥakím Md. Kabiruddin, *Some Lesser known Facts about Arabian Medicine*, p. 12.

[2] *Ibid.*, pp. 12 and 15.

[3] *Ibid.*, p. 12.

[4] *Ibid.*, p. 12.

[5] *Ibid.*, p. 14.

[6] *Ibid.*, p. 13.

[7] *Ibid.*, pp. 13-14.

[8] *Thesaerus, Book*, VI, p. 6.; Ḥakím Md. Kabiruddin, *Some Lesser known Facts about Arabian Medicine*, p. 13.

16. The modern germ theory appears to be based on the observation of Avicenna who has discussed in detail that unless a bodily secretion is contaminated by foul foreign earthly body no infection can take place. And the Spanish Arab physician Ibn Khátima (d. 1369) has observed that man was surrounded by minute bodies which enter into human system and produce disease. These remarks, as Dr. Gruner has observed, gives us a glimpse of the modern germ theory.[1] The keen observation of the contagious character of Plague described by Ibnu'l-Khaṭíb (1313-77) as well as by Ibn Khátima also leads to the above theory. Ibnu'l-Khaṭíb in a passage quoted by M. Meyerhof observes : "The existence of contagion is established by experience, study, and the evidence of the senses, by trustworthy reports on transmission by garments, vessels, ear-rings; by the spread of it by persons from one house, by infection of a healthy sea-port by an arrival from an infected land . . . . . by the immunity of isolated individuals and . . . . . nomadic Beduin tribes of Africa . . . . . It must be a principle that a proof taken from the Traditions has to undergo modification when in manifest contradiction with the evidence of the perception of the senses."[2] And Ibn Khátima remarks :—

"The result of my long experience is that if a person comes into contact with a patient, he is immediately attacked by the disease with the same symptoms. If the first patient expectorated blood, the second will do so . . . . . If the first developed buboes, they will appear on the other in the same places. If the first had an ulcer, the second will get the same; and the second patient likewise transmits the disease."[2]

17. Al-Jurjání (d. 1136) was the first to mention in the chapter of Diseases of the Throat in his book *Dhákhira-i-Khawárazmsháhí*, the connection between *exophthalmos* and *goitre*, a sign which

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[1] Hakím Md. Kabiruddin, *Some Lesser known Facts about Arabian Medicine*, p. 15.

[2] *Legacy of Islam*, pp. 340-41.

is said to have been rediscovered 600 years after him by Parry in 1825.[1]

Medicine :

18. On small pox and measles ar-Rází was the first physician to write an independent treatise *Kitábu'l-Ḥaṣbati-wal-Judari* which has been translated into more than a dozen European languages and is described as an ornament to the medical literature of the world. In this book he pointed out for the first time, that small pox and measles were different diseases having different pathological conditions.

19. He was also the first to write an independent treatise on 'Habits which become Natural' and thus he anticipated the conditioned reflex theory of Sherrington.[2]

20. He also wrote an independent treatise on the diseases of children and therefore he might be rightly considered to be the father of *Pediatrics*.

21. He also gives in his al-*Ḥáwí*, his own independent opinion on a large number of diseases and their treatments, after having quoted the opinions and remarks of all the important previous writers on the subject. A critical study of these observations of the author is sure to yield important results showing his independent contribution to medical science. The original Arabic text of the book is now being printed by the Dá'iratul-Ma'árif of Hyderabad Deccan, and six volumes of it have already been published. For this important publication we must be grateful to the enthusiastic efforts of the active and zealous director of the Dáira, Dr. Niẓámu'd-Dín.

22. Abu'l-Ḥasan the physician of 'Aḍudu'd-Dawla introduced the process of bleeding for the treatment of cerebral haemorrhage and apoplexy.[3]

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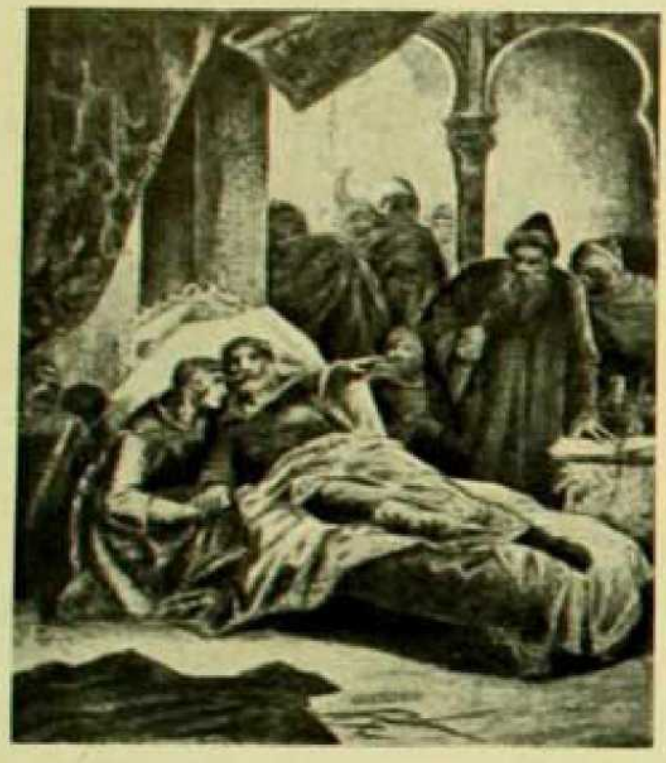
[1] *A Medical History of Persia*, p. 217.
[2] *Ibid*, p. 202.
[3] *Ibid*, p. 150.



A. Arab Surgeons Standing near Frederick II of Hohenstaufen (1194-1250 A.D.)

From the *Adábu'l-Lughati'l-'Arabiyya* of Jurjí Zaydán Vol. 4, p. 158).

B. Cautarization by the Arab Surgeons on the wrist of Frederick II.

From *al-Hilál* (July 22, 1927) of Maulánáa Abul'l-Kalám Azád.

23. Abu'l Qásim az-Zahráwí (d. 1013) has observed in his book (*Kitabu't-Taṣrif*) that the spinal paralysis was caused by the injury within the Medulla or Cord.

24. The Arabian physicians made use of stomach tube and performed the gastric lavage in cases of poisoning. They used cannulated tubes instead of the modern rubber tubes.[1]

25. The Arabian physicians according to Dr. Taufíq Ṣuṣa were fully conversant with the principle of Opotherapy, the treatment of diseases by the administration of animal organs or extracts from them. In this connection Dr. Taufíq observed, "Although for the last 50 years the credit of the revival of this method of treatment has been attributed to Brown Sequard, bringing him world-wide fame, yet the method has, in fact, been widely in vogue since long in Asia Minor, Syria, and other places." Following this principle the practitioners of Arabian medicine used animal brain and testicles for invigorating the respective organs in their patients. Indian practitioners of Arabian medicine have been using for long time the liver for hepatic diseases, spleen in diseases of spleen and brain for mental disorders.[2]

26. Baháu'd-Daula (d. 1507) was the first, according to Elgood, to record in his *Khuláṣatu't-Tajárib*, the spontaneous cure of cutaneous leishmaniasis after twelve months of ulceration. He was also the first to describe several diseases including hooping cough which were not recognised in Europe for centuries after him.[3]

Surgery :

27. To surgery the Arabian surgeons made very valuable contributions. Abu'l-Qásim az-Zahráwí invented many delicate

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[1] Hakim Md. Kabiruddin, *Some Lesser known Facts about Arabian Medicine*, p. 17.

[2] *Ibid.*, p. 17.

[3] *A Medical History of Persia*, pp. 354-55.

surgical instruments the illustrations of which he has given in his book *Kitábu't-Taṣríf*.

28. Ibn Zuhr (1113-1162) for the first time referred to the operation of Tracheotomy in his book *Kitábu't-Taysír*. This must be accepted as his independent contribution to surgery, for the Greeks have made no mention of it.

29. Avicenna deserves credit for introducing the treatment of lacrymal fistula by probing, when he suggested the introduction of a medicated probe into the channel.

30. The Arabian physicians were well-aware of the cold application for stopping Haemorrhage, of the thermocautery of wound, of the use of Cauterizing agents as well as of the silk legatures. Suturing of wound by the use of silk thread and of alcohol was for the first time described by ar-Rází.

31. To the Arabian physicians should go the credit of discovering Anaesthesia and of causing unconsciousness in certain cases for seven days, before the major operations.[1]

32. Dry dressing was stressed by Avicenna in his *Canon*. He pointed out that healing was hastened by this method.

33. To the eye-surgery the Arabian physicians made the greatest contributions of their own. They carried out skilfully and successfully every operation of the eye that is performed in modern times.[2]

34. They knew well that cataract was due to the opacity of the lense.

35. The Arabian medical men used various kinds of lenses for defective vision. The commentator of *al-Asbáb* has mentioned these lenses in the chapter on cataract.

36. To Avicenna is due the credit for prescribing the complete and thorough removal of the tissues and all blood vessels of the affected part and its adjoining areas, as treatment of Cancer (Sarṭán). According to him even then the cure is

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[1] *A Medical History of Persia*, pp. 281-85.

[2] *Ibid.*, p. 285.

The earliest graphic representation of the Caeserian operation.

From a Ms. of al-Bīrūnī's *al-Athāru'l-Bāqiyya*. Copied at Tabriz in 1307 A.D. and preserved in Edinburgh University Library (Arabic 161, fol. 16 a).

not certain.[1] Baháu'd-Daula, however, has remarked that there is no treatment for this disease excepting application of lead dissolved in Aqua Fortis.[2]

37. Among the operations of the head they performed amputations of Uvula and nasal polyps, tonsillectomy, paracentesis of the drum of the ear, excision of the whole tongue for malignant growths and removal of the diseased bone from the skull, replacing it by a piece of bone from the skull of a dog for treatment of Osteomyelitis of skull.[3]

38. They performed abdominal operation and drained the peritoneal cavity for peritoneal abscess in the approved modern style, and used the sitting-up position and special drainage tube (Trocher and canula) which were later adopted by Fowler and Potin. A detailed description of the method of operation is given by Baháu'd-Daula.[4]

Midwifery :

39. The Greeks have left no records of any material progress in midwifery. The Arabian physicians were the pioneers in this branch of the science of medicine. Modern midwifery has been built upon the basis of the attainment of the works of Arabian writers on this subject.

40. Abu'l-Qásim az-Zahráwí who was well versed in midwifery has fully described in his book *Kitábu't-Taṣríf* what is known as the 'Walcher's position' of a child.

41. He performed the operations of Cranioclasty for the delivery of dead foetus. He has described it fully in an independent chapter in the above book.

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[1] The *Canon*, Vol. III, p. 137.
[2] Elgood, *A Medical History of Persia*, p. 287.
[3] *Ibid.*, pp. 286-87.
[4] *Ibid.*, p. 288.

Discovery of new drugs and the therapeutic agents :

In this branch of medical science the contributions of Arabic writers are immense. Some of them are given below :—

42. The *Mufradát* of Ibnu'l-Bayṭár has described the medical properties of more than 1400 herbs whereas the earliest Persian book on the subject, the *Kitábul-Abniya-'an-Ḥaqáiqi'l-Adwiya* of Ibnu'l-Muwaffaq, contains the description of only 585 drugs. Ibnu'l-Bayṭár's work can be said to be the main basis of the first British Pharmacopoeia.

43. Ar-Rází introduced mercury ointments which he might have borrowed from the Indians.

44. He was the first physician to introduce wet-cupping for the treatment of apoplexy and cold water application in typhoid.

45. Avicenna for the first time recommended the use of water bed. His idea has been greatly developed in modern times in the form of "Leitter's tubes," ice-bags, cold sponging etc.[1]

46. "The science of pharmacy" says Elgood, "was nowhere more highly developed or more exact, than in the city of the Caliphs". "Meyerhof has shown", he adds, "that the druggists could, if needed, measure out their wares to the fraction of a grain"[2] . . . . . According to Gustave Le Bon pharmacy is an Arabian contribution to medical science. Many new processes—making of syrups and electuaries, ointments, liniments, and the silver and gold coatings, use of fats and oily substances, emulsions, etc. were introduced by them. Chemicals, like sulphuric acid, Nitric acid, Hydrochloric acid, alcohol and vinegars were used for the first time, as medicaments, by the Arabian physicians.

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[1] Ḥakím Md. Kabiruddin, *Some Lesser known Facts about Arabian Medicine*, p. 20.

[2] *A Medical History of Persia*, p. 254.

47. Some of the Arabian medical writers questioned the Greek theory of four elements.

48. They generally believed in the theory of individual nature of every man. Avicenna accepted this theory; and all the Arabian physicians in treating their patients relied upon the natural defensive power of every individual patient. Modern preventive medicine, according to Le Bon, is based on this very principle. Ibn Zuhr of Spain showed that nature itself worked in every human body and is capable of curing many ailments without any medication.[1]

49. Abu'l-Ḥasan-aṭ-Ṭabarí was the first to describe the itch-mite, now called, "Sarcoptes" which causes itch.

50. He also pointed out that tuberculosis was a material infiltration and that organs other than the lungs could be affected by it independently. Anal-fistula and fissures could thus cause lesions in the lungs or other organs.[2]

These are some of the definite independent contributions of the Arabian physicians and surgeons to medical science. Some more facts may be added. But a proper assessment of the value of Arabian medicine is not possible before the publication of all the important Arabic medical works and their critical study by competent medical men. This must take a long time. It demands hard work which is sure to yield valuable results.

II

Arabian Hospitals
(i.e., the hospitals in which Arabian Medicine was followed)

Hospitals are great glories of Islam.

"These hospitals", remarks Ibn Jubayr about the hospitals which he saw at Damascus, "are among the great glories of Islam[3]". As a matter

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[1] Ḥakím Md. Kabiruddin, *Some Lesser known Facts about Arabian Medicine*, p. 10.

[2] *Ibid.*, p. 16.

[3] *Travels*, p. 296.

of fact the whole network of hospitals which was established by the Muslim Caliphs, Sultans and noblemen throughout the vast Islamic dominions must be considered to be among the great glories of Islam. Being started at the beginning of the second century of Islamic era, it developed and spread simultaneously with Islamic power and Arabian Medicine, in all the countries conquered by the Muslims, and ultimately served as a model for the modern European hospitals.

The first Arabian hospital.

The first Arabian hospital was established about the same time when the earliest Arabian Medical books were composed during the Umayyad regime. It was founded by Walíd b. 'Abda'l-Malik in the year 88 A.H. (707 A.D). He had built guest-houses for the travellers, homes for the blind and the lepers, supplied them with food and cloths and other necessities of life and prevented them from going out of these homes. He also built a hospital for the sick persons, appointed physicians for their treatment and provided them with all their requirements.[1]

Its number increased.

As the Islamic state advanced and developed and Arabian Medicine progressed under the tolerant and all-embracing spirit of Islam, hospitals also increased in number and developed the scope of their activities. Every big town had its own hospital and arrangements were made that every village also might get medical aid at least at the time of emergency.

Two classes of hospitals.

The hospitals were of *two* classes : (1) The fixed hospitals which were located at particular places, (2) The mobile hospitals which moved from place to place stopping at every place as long as necessary. Each of these two classes of hospitals had particular competent physicians, assistants, surgeons, and a dispensary attached to it.

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[1] al Maqrízí, *Kitábul Khitat*, Chapter on Bímáristán.

A hospital in Cordova, in which az-Zahráwí is seen examining a patient.

From the "*Fann-i-Jarráḥí ki Tárikh*" of Ḥakím Jaláh'd-Dín Ḥusámi

1. Numerous fixed hospitals which were situated at different places in Africa, Egypt, Syria, Arabia, Mesopotamia, Persia and other Islamic countries have been described by Ibn Abí 'Uṣaybi'a in his *Ṭabaqátúl-Aṭibbá'*, by al-Maqrízí in his *Khiṭaṭ*, by Ibn Jubayr in his *Travels* and by other historians in their works. Several of them have been noticed by Elgood in his *Medical History of Persia*.[1]

Fixed hospitals.

Describing a hospital which was founded in Morocco about 1200 A. D. and quoting 'Abdu'l-Waḥíd of Morocco, Elgood says :—

A hospital in Morocco

"Here was constructed a hospital, which I think is unequalled in the world. First there was selected a large open space in the most level part of the town, orders were given to architects to construct a hospital as well as possible. So the workmen embellished it with a beauty of sculpture and ornamentation even beyond what was demanded of them. All sorts of suitable trees and fruit trees were planted there. Water there was in abundance flowing through all the rooms. In addition there were four large pools in the centre of the building, one of which was lined with white marble. The hospital was furnished with valuable carpets of wool, cotton, silk, and leather, so wonderful that I cannot even describe them. A daily allowance of thirty dinars was assigned for the daily ration of food, exclusive of the drugs and the chemicals which were on hand for the preparation of draughts, unguents, and collyria. For the use of the patients there were provided day-dresses and night-dresses, thick for winter and thin for summer.

After he was cured, a poor patient received on leaving the hospital a sum of money sufficient to keep him for a time. Rich patients received back their money and clothes. In short, the founder did not confine

Monetary help for poor patient.

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[1] p. 288 etc.

the use of the hospital to the poor or to the rich. On the contrary, every stranger who fell ill at Marrakesh, was carried there and treated until he either recovered or died. Every Friday the prince after the mid-day prayer mounted his horse to go and visit the patients and to learn about each of them. He used to ask how they were being treated. This was his use until the day of his death."[1]

Manṣúrí Hospital

A similar hospital was founded in the year 683 A.H. (1284 A.D.) by Muḥammad Qalá'ún entitled al-Manṣúr at Cairo on the model of the Núrí hospital of Damascus which was founded earlier by Núrúd-Dín Zanjí. It was known as al-Bimáristán al-Manṣúrí (Mansurī hospital). Al-Maqrízí has left a graphic description of it.[2] According to him the hospital was situated in a large palace occupying an area of ten thousand and six hundred yards. It contained four large buildings each of which had round itself large open field with tanks and fountains. For the expenses of the hospital and other connected charitable institutions the founder had made an endowment of properties yielding an annual income of about ten lacs of dirhams, and appointed several officials to manage them and keep complete accounts of the income and expenditure. The hospital was open to the poor as well as the rich, the military men as well as the civilians, the adults as well as the children, the free men as well as the slaves, the male as well as the female. It was provided with all the medicaments and other requirements of the patients including beds and clothes for them. Competent physicians and male and female servants and nurses with fixed pay and allowances were appointed to attend and take care of them. There were separate wards for the male and the female patients. There were independent wards for every class

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[1] *A Medical History of Persia*, pp. 176-77.

[2] *al-Khiṭaṭ*, Chapter on Bimáristán.

of them. The main halls of the four buildings were fixed particularly for the patients suffering from fever and similar diseases. There were special wards for the eye-patients, for surgical cases and for those suffering from diarrhoea. There was a particular ward for the patients suffering from cold diseases. Water flowed through all the various wards. There were separate independent rooms for pharmacy, for dispensary, for kitchen and for stores. There was a special hall for the chief physician where he delivered lectures on the medical science. The number of the patients and the period of their stay in the hospital were not fixed. There were arrangements for all kinds of help for the outdoor patients also.[1] This hospital was much admired by the later European travellers.[2]

Hospitals seen by Ibn Jubayr.

Before the Manṣúrí hospital and after the Tulunide hospital were established two other hospitals also one at Cairo and the other at Miṣr, which were seen and admired by Ibn-Jubayr in the year 1183. Among many other hospitals which he saw during his travels, there were two at Damascus. While describing them he remarks about one of them: "It has a staff who maintains a register that records the name of the sick and the items they required, of medicine, food and other things. Early each morning the physicians come to the hospital to visit the sick and order the preparation of the proper medicines and food according as suit each person." [3]

'Aḍudí Hospital

Far bigger and better than the above hospitals was the 'Aḍudí Hospital of Baghdád which was founded in the year 982.A.D. by 'Aḍudu'd-Daula. To it were brought the best medical talents of the time, available in the whole of the Eastern Caliphate. The number of its medical

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[1] al-Maqrizi, *al-Khiṭaṭ*, Chapter on Bimáristán. *Cf.* Browne's *Lectures on Arabian Medicines*, pp. 101.2.

[2] *Lagacy of Islam*, pp. 349-50.

[3] *Travels*, p. 296.

staff at one time, had reached eighty. Probably it served as a model for the hospitals which were built in the later period at different places.

Number of Hospitals increased

The number of the hospitals, however, increased by and by. In every big town in every province of the State were established one or more hospitals according to its requirements. In the small town of Arbela, for example, its chief Abú Sa'íd Kúkubúrí built four asylums for the blinds and the patients of chronic diseases.[1]

Four at Arbela

In Cairo according to Maqrízí there were three big hospitals.[2] There is also a record of several hospitals which were established at Mecca, Medina and Damascus, and were seen by Ibn Jubayr during his travels.

Three at Cairo

Rashídu'd-Dín Faḍlullah, the learned and able minister of Gházán Khán, not only repaired and renewed the old decaying hospitals but also founded several new splendid and well equipped ones at Hamadán, at Sultániya and at Gházániya. Some of them have been described by E. G. Browne and by Elgood.[3] Tamerlane who is generally known only for his cruelty had decreed that each city of his realm should be provided with at least one mosque, one school, one serai (guest house) and one hospital.[4] The present system prevailing in Europe of having such institutions in every village is probably the result of the influence of the practice prevailing in Islamic States during the medieval period. In Delhi, however, under Moḥammad b. Tughluq there were seventy hospitals.[5] His successor Fírúz Sháh who was himself a competent physician, as will be seen

Tamerlane's Order.

70 hospitals in Delhi.

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[1] Elgood, *A Medical History of Persia*, p. 172.

[2] *al-Khiṭaṭ*.

[3] *Lectures on Arabian Medicine*, pp. 103-5; *A Medical History of Persia*, pp. 311-15.

[4] *A Medical History of Persia*, p. 173.

[5] *E. & D.*, Vol. III, p. 576.

later, founded several more hospitals in Delhi.[1] Sher Sháh had appointed a physician in every guest house which he had established, throughout his dominion. The twelve commandments issued by Jahángír, the Moghal Emperor of India, on his coming to the throne, included one for the establishment of a hospital in every big town and the appointment of physicians for the treatment of the patients, at the expense of the state.[2]

Sher Sháh's Order.

Jahángír's Command.

In Baghdad there were sixty well-organised medical institutions when Benjamin of Tudela visited it in the year 1160. Describing these medical institutions Benjamin has observed: "All (the sixty medical institutions) are well provided from the king's stores with spices, and other necessaries.

60 well-equipped hospitals in Baghdad.

Every patient who claims assistance, is fed at the king's expense until his cure is completed. There is further the large building called the Dáru'l-Marphtán in which are locked up all those insane persons who are met during the hot season, every one of whom is secured by iron chains until his reason returns, when he is allowed to return to his home. For this purpose they are regularly examined, once a month by the king's officers appointed for that purpose, and when they are found to be possessed of reason, they are immediately liberated. All this is done by the king (al-Mustanjid billah) in pure charity towards all who came to Baghdad, either ill or insane, for the king is a pious man and his intention is excellent in this respect."[3]

To some of these hospitals like the Mansurī Hospital of Cairo and 'Aḍúdí Hospital of Baghdád, were attached medical schools also where reputed physicians delivered their lectures and their students received practical training. In the hospital at Tabriz

Medical Institutions attached to hospitals.

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[1] *Firishta*, Reign of Firuz Shah.
[2] *E. & D.*, Vol. VI, p. 512.
[3] *A Medical History of Persia*, p. 172.

ten students were attached to each of the fifty physicians and five students to each of the surgeons and bone-setters. These students had definite duties in the hospital.[1] Some of them, however, had good libraries as well The dispensaries of some of these hospitals were also like treasure-house for works of arts. For many of them like those founded by Rashidu'd-Din, were enriched with objects of art, porcelain vases, pitchers, etc., so that it was said that some of the bigger pharmacies rivalled the royal palaces.[2]

Mobile hospitals.

2. The second class of hospitals that is the mobile[3] hospitals, however, were organised from time to time and carried on beasts of burden to visit outlying places requiring medical relief either ordinarily or at the time of emergency like the spread of epidemics. The earliest of them was organised at the suggestion of Sinán b. Thábit (d-331/942), the then inspector general of the hospitals of Baghdad. He was asked by 'Alí b. 'Isa, the minister, to organise a travelling hospital to visit the various places where the prisoners were lodged, for their number was large and the places of their residence were unsuitable. They were, therefore, likely to be sick but unable to get medical advice and relief. He was, therefore, ordered to organise a special party of physicians who should have with them a dispensary also. They should visit all the prisons in different places, examine the sick among them and supply them with the necessary medicine which they might require. Sinán acted according to this order, throughout his life. He had also received another order from the same Wazir instructing him to send physicians and dispensaries to the various parts of Sawád (suburbs) moving from place to place stopping at every place as long as necessary, and treat all those who suffered from any disease. He was also advised to

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[1] Browne, *Lectures on Arabian Medicine*, p. 109.

[2] *A Medical History of Persia*, p. 181.

[3] *Ṭabaqátul Aṭibbá*, Vol. I, p. 221., *Táríkhu'l Ḥukamá*, pp. 193-94.

instruct the physicians to go from village to village and from place to place where there might be raging any epidemic. In case they failed to find any escort or guide they should wait until the road was safe and travelling was free from danger.

III

Hospitals in Muslim India

• Reference has already been made to the establishment of numerous hospitals, and to the measures taken by the Muslim rulers of India for the medical relief of the people of the country. Most of them were well educated in the various branches of Islamic culture and had special interest in certain branches of it. They had great respect for learning and learned men whom they attracted not only from various parts of this country, but also from foreign lands like Persia, Mesopotamia, Syria and other Islamic dominions, to the capital of India, by showering favours upon them and by bestowing upon them landed properties as well as other gifts of various kinds. In this they were also helped by the disturbed conditions prevailing in certain Islamic countries, which ended in the sack of Baghdad by the Mongols. A list of these Indian and non-Indian scholars is given by Baraní and other historians under the various reigns. Thus Delhi, which was made the capital of Muslim India in 1210 A.D., soon became, at first, a rival of Baghdad and later on, replaced it in greatness and glory not only materially but also culturally. Throughout the reign of 'Aláu'd-Din Khaljí for example, "there lived in Delhi" writes Baraní "such scholars and savants as were unrivalled in Bukhárá, Samarqand, Baghdád, Egypt, Khawárazm, Damascus, Tabríz, Ispbahán, Ray and Asia Minor, and like whom could not be found in the habitable world"[1]. Giving the names of the experts in

[1] Baraní, *Tárikh-i- Firúz Shábí*, pp. 352-366.

various branches of science and arts the author mentions the names of physicians, surgeons, and ophthalmologists like Badru'd-Dín of Damascus, Ṣadru'd-Dín the physician, Mah Chandra the auspicious physician and Jaja (chacha) the expert surgeon and 'Alimu'd-Dín the ophthalmologist, all of whom were unrivalled throughout the length and breadth of India and says that "there were also during this period in Delhi other physicians from among the Nagoris and Brahmans and Chaities"[1].

Some of the Muslim rulers of India like Muhammad b. Tughluq and Firúz Sháh Tughluq, were specially interested in the science of medicine. The former who was well educated in all the branches of Islamic literature had special interest for medical science, was well experienced in the treatment of various diseases and cured a large number of patients. He discussed medical problems with the expert physicians and convinced them of the correctness of his own views.[2] The latter, according to the contemporary accounts, was well versed not only in the theological subjects but also in astronomy and medicine and had special interest in them. He had a large number of books on these subjects in his library. He got constructed a special type of astrolabe and fixed it on the highest minaret of Fíruzábád. At his dictation was composed a book called *Ṭibb-i-Firúz Shâhí* which, according to the author of the *Sirat-i-Firúz Shâhi*, was a sure proof of his mastery of the science of medicine. It contained the description and the method of treatment of several diseases which were not mentioned in the *Canon* of Avicenna, nor in the *Dhakhira* (Thesaurus) or the *Aghrâḍuṭ-Ṭibb* of al-Jurjáni. He was also a good bone-setter and successfully bandaged the fractures of several of his associates in hunting expeditions, in the style of the experts and the masters of the art. He was keenly interested in ophthalmology and prepared a collyrium composed of the skin of the black

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[1] Baranī: *Târîkh-i-Firûz Shâhî*, p. 363.

[2] *Ibid.*, pp. 463-64.

The gate (A) and the building (B) of the Dáru'sh-Shifá a hospital built in 1595 A.D. in Hyderabad.

With the courtesy of Dr Yûsufu'd-Dîn of Osmania University, Hyderabad.

snake and other drugs. It was known as Kuḥl-i-Fírúz Sháhí and proved effective in many diseases of the eye.[1] These and the other Muslim rulers of India partly on account of their interest in the well-being of the people of this country, partly on account of their special taste for medical science and partly on account of the dictate of their religion according to which to attend the sick is an act of the greatest religious merit, making use of the large medical talents available to them, established numerous hospitals throughout their dominions, the ruins of some of which can be still seen in certain parts of this country.[2] In Delhi alone, according to Elliot[3], there were seventy hospitals during the reign of Muhammad b. Tughluq. The number of additional hospitals established by Fírúz Sháh Tughluq is not certain. Neither 'Afíf nor Baraní has stated it. Firishta writes, "He constructed fifty dams, forty mosques, thirty colleges, twenty monasteries, hundred palaces, five hospitals, ten public baths, hundred bridges, and dug hundred and fifty wells and planted innumerable gardens, making endowment for the upkeep of each of them."

But it is unfortunate that we know little about the working of these hospitals. Fírúz Sháh, however, in his *Futúḥát* has referred to the foundation of a hospital for all classes of patients and to the appointment of the physicians for their examination and treatment and free supply of medicine and food to them.[4] 'Afíf tells us that like all the previous rulers Sultan Fírúz Sháh bestowed his kind attention on the sick and out of his natural concern for them founded a hospital for the treatment of patients for all classes of people without distinction, appointed in it

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[1] *Sirat-i-Firuz Shahi*, Ch. IV, fols. 161-176. I am indebted to Prof. Ḥasan 'Askari of Patna for supplying me a copy of these pages of the Ms.

[2] One example of it is the Dárush-Shifá which was built by Md. Quli Qutbshah V in 1595 A.D. (*Landmarks of the Deccan's*) by A. A. Bilgrami (Hyd-1927) pp. 25-26.

[3] *Elliot* and *Dawson*, Vol, III, p. 576.

[4] *Futúḥát-i-Fírúz Sháhí*, pp. 15-16.

distinguished physicians and commanded them that whenever a patient approached them they should feel his pulse, diagnose his disease thoroughly and treat him sympathetically and administer to him the proper medicine. He made it clear to those who were in charge of the hospital that he had built it for patients in general and had appointed expert physicians, surgeons, ophthalmologists as well as attendants and nurses in the hospital and had provided it with free medicines and diet for the patients. The patients came to the hospital from all quarters. They were respectfully received and quickly attended to, by its employees and inmates. Experienced physicians who sat in a room at the gate of the hospital reclining on the cushions, waiting for them, examined them. Medicine was administered to them. The patients after being cured, offered prayers to God, showing his gratitude to Him for his cure and wishing prosperity to Sultan Fírúz Sháh and returned to his kith and kin. Fírúz Sháh had made an endowment of villages yielding an annual income of thirty-six lacs of tankas for the maintenance of the hospital and other works of poor relief.[1]

The author of the *Sirat-i-Fírúz Shâhi* which was completed in 772 A.H./1370 A.D. the twentieth year of the reign of Fírúz Sháh Tughluq, and of which a unique and valuable manuscript is preserved in the Khuda Bukhsh Library of Bankipore and has been described by 'Abdu'l-Muqtadir,[2] gives us in its fourth chapter the details of the simple drugs as well as of the compound medicaments which were kept in the hospital for the patients suffering from various diseases from head to foot. From the account of the hospital given by the author of this valuable book which deserves publication, it appears that Fírúz Sháh personally visited it and treated the patients suffering from various diseases. He had also ordered that every one suffering from

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[1] *Târikh-i-Fírúz Shâhi*, pp. 353-59.

[2] Catalogue of the Arabic and Persian Manuscripts of Or. Pub. Library Bankipore, Vol. VII pp. 28-33.

insanity should be captured, chained and kept in the hospital and treated with medicine prescribed by himself which were tried and found useful. He also ordered that they should be provided with the special diet which was also recommended by the Sultan himself.[1] From this book it also appears that he had established mobile as well as fixed hospitals and appointed competent physicians for each of them.[2]

I have been unable to find any detail with regard to the organisation and the administration of the Indian hospitals of the medieval period in the books which I have consulted. But it may be suggested that these hospitals were also organised and administered on the same lines as those in other Islamic countries. For, as it is well known, all the Islamic countries in middle ages had close relation and communication among them. Their institutions of various classes, therefore, were also influenced by one another.

One important and interesting problem with regard to medieval Indian hospitals is to determine the place of Indian system of medicine and its practitioners in these institutions. There is no doubt that just as in the hospitals in other Islamic countries the medical men belonging to the various communities, the Jews, the Christians and the Muslims, were working together and in Baghdad the Barmacid hospital was run under the supervision of Indian physicians, Manka (Manakya), and Ibn Dhann,[3] who followed the Indian system of medicine, so in the Indian hospitals also the Hindu and the Muslim medical men worked together and the Unání and the Indian systems were followed simultaneously. It is recorded that in the great hospital which was established by 'Alāu'd-Dín Ahmad II, the second of the Bahmanid kings of Bidar on which were endowed several villages from the income of which the cost of medicine, food and drink of

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[1] Ms. of the *Sirat-i-Fírúz Shāhí* Or. Pub. Library, Bankipore No. 547 fols. 161a and 170a.

[2] *Ibid.*, fol. 118.

[3] *al-Fihrist* pp. 245, 303; see also *infra* pp. 36-37.

the patients were disbursed, the Muslim Ḥakíms as well as the Hindu Vaidyas treated and looked after the patients.[1] The same was the case with the hospital which was founded during the reign of Aurangzeb, by Nawwáb Khayr-Andísh Khan Kambuh, at Etawah. The Nawwáb himself was well versed in the science of medicine. He wrote a book which is well known as the *Khayru't-Tajárib*, the best of the experiences, and has been published more than once. In the preface to the book, he writes: "This poor sinner named as Md. Khan and entitled as Khayr-Andísh Khan, for the sake of the divine recompense, founded a hospital in the town of Etawah, and appointed several physicians like 'Abdu'r-Razzáq Naysáburi, 'Abdu'l-Majíd Isphahání, Mirza Md. 'Alí Bukhárí, Md. 'Adil, and Md. A'ẓam, from among the practitioners of Greek system of medicine, and Kanwal Nayn, Sukanand and Naynsukh, from among the Indian Vaidyas who are my old friends, so that they might keep in it valuable and easily available medicines of all kinds together with necessary diet and food for the poor patients. They should also keep in it everything else that might be required for the proper treatment and attendance of the patients. The hospital, by the grace of God, is working according to my desire."[2] From the working of these two hospitals it may be concluded that in the other Indian medieval hospitals also, generally, the Greek as well as the Indian system of medicine was followed simultaneously.

The assertion, that the Muslims of India had an aversion rather than attraction for the arts, sciences and culture of this country and that the strained political relation between the rulers and the ruled was repugnant to any joint cultural or scientific

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[1] Sherwani, *Bahmanis of the Deccan*, pp. 227-28. I am obliged to Dr. G. C. Raychaudhuri, the Secretary of the University College of Arts, Calcutta, for drawing my attention to this book.

[2] *Athári-Khayr* by Sayyid Aḥmed Márahraví, Agra, 1323 A.D. In this excellent book, the author has mentioned numerous charitable hospitals which were established at Malwah, Bhagnagar, Agra, Surat, Ahmadabad, etc.

activity by them, must be set aside as unreasonable and unfounded.

I have shown in chapter IV of this book the great appreciation by the Arab Muslims for India and its culture.[1] This appreciation and admiration for Indian culture was shared by the Muslim rulers and learned men of this country also. They always differentiated between the political and the social and cultural aspects of life. Strained political relation with any country or with its people did not affect their cultural and social relations with them. Throughout the history of Islam, in spite of strained political relation between the Muslim and the Christian countries, the cultural relation between them had ever been fair and friendly. Similar had been the case with India and its people. While Maḥmúd of Ghaznā had been at war with the Indian chiefs and Princes, his courtier and protégé, the well-known Muslim scholar al-Bīrúni established friendly relations with the Hindu scholars and savants, discussed with them Indian cultural problems and dealt with them in several of his books, particularly in the *Kitábu'l-Hind*.

When Muslim rule in India was established, most of the Muslim rulers encouraged the cultivation of Indian languages, of Indian arts and crafts and of Indian sciences. Indian scholars and poets like Amír Khusrau sang in their poems the praises of Indian culture. A part of his poem the *Nuh Sipahr* (the Nine Spheres) is a brilliant example of it.[2] He also acquired mastery of some of the Indian arts specially music and introduced many innovations in it and wrote poems in Hindi.[3]

'Alau'd-Dín Khaljī, in spite of his continuous warlike activities attracted distinguished Indian scholars, astronomers and physicians to his capital.[4] Fírúz Sháh Tughluq, a strictly

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[1] See *infra*, pages 32-37.

[2] *E. and D.*, Vol. III., pp. 562-64.

[3] *The life and works of Amir Khusrau* by Dr. Md. Waḥíd Mirzá pp. 238-40.

[4] *Tárikh-i-Fírúz Shahí*, by Baraní, pp. 362-65.

orthodox Muslim, on conquering Nagarkot, took possession of the thirteen hundred Sanskrit books which were preserved in the library of its temple and with the help of some of the Pandits, got some of them translated into Persian.[1] Among these works were included the (1) *Sarâwâli* (of Kalyana Verman, a king of Bengal) on astronomy, (2) *Haramekhela* also called *Uddisa-Tantra* (or *Uddisa Shastra*) on astrology, (3) *Damātha* (?) and a book on the physical sciences of the Indians on which was based the long poem of 'Izzu'd-Din Khâlid which is known as *Dalâil-i-Firúz Shâhi*. Sultan Sikandar of the Lodi dynasty, another strictly orthodox Muslim ruler of India, ordered his powerful and learned minister, Mian Bhova, to write a book on medicine based entirely on the important works of authoritative Indian writers on the subject. The compilation of this book which I have dealt with in detail in chapter VII[2] and is described by a comtemporary writer as "the most reliable book (in Persian) on the subject (Indian medicine) the excellence of which can be realised only by perusing it",[3] required complete co-operation of the experts in the Arabian and the Indian systems of Medicine. Mián Bhova was not only well versed in Islamic sciences and in Indian Medicine as his book on this subject shows, but also appears to have acquired special taste for Indian music. He had ordered his musicians to play first the tune of Koda and then Kalyana, after it Kaṇaḍa and to conclude their music with the Ḥusainí tune(?), and took them to task if they disregarded his instructions. Another Amír of Sikandar Lodi, A'ẓam Humáyún Shirwání, associated with the Indian musicians and story-tellers who were known as Kathaks.[4]

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[1] *Ma'âthir-u'l-Umarâ*, Vol II, p. 190.

[2] See *infra*, pp. 96-109.

[3] *Târikh-i-Mushtâqi*, Photographic copy of Muslim University, F 27a. I am indebted for the perusal of this book to Mr. Muḥibb-ul-Ḥasan, Reader in History at Muslim University, Aligarh, who lent the book to me for a few days.

[4] *Ibid.*, F 38 a-b.

Another Amír of Sikandar Lodi, Mián Ṭáhá was well versed not only in Islamic literature and sciences, but also in Indian music, Indian medicine and Indian arts and crafts. He had by heart twenty-four thousand verses (Ushlokas) on Indian medicine, and Hindu experts in Indian medicine and music took lessons from him on these subjects.[1] And 'Aláu'd-Dín Ḥusain Sháh of Bengal (1493-1519 A.D.), employed as his personal physician, a Hindu Vaidya, Mukunda Das (*History of Bengal*: ed. J. N. Sarkar. Vol. II, p. 152).

The above facts should suffice to prove the keen interest of even the most orthodox Muslim rulers and noblemen in the sciences and arts of this country, and thorough co-operation of the Muslim and the Hindu scholars in the realm of science and culture, since the early period of Muslim rule in Northern India. It also leads us to the conclusion that in the working of the Indian hospitals the Muslim Ḥakíms and Hindu Vaídyas co-operated and took part jointly.

IV

Influence of Islamic Hospitals on Modern European Hospitals

The Islamic medical institutions of the middle ages influenced their development in various countries in Europe, since the thirteenth century. Referring to the European hospitals of this period Meyerhof remarks: "They may well have been imitations of such splendidly installed *Bimaristans* (Hospitals) as that of the contemporary Seljúq ruler, Núral-Dín, in Damascus and that of the Mamlúk sultan, al-Mansúr Qalā'ūn, in Cairo. The latter institution was much admired by European travellers of later centuries, and after a period of decay has seen a renaissance in our time. In Italy Pope Innocent III founded in Rome at the beginning of the thirteenth century, the Hospital San Spirito from which a network of kindred institutions soon

[1] *Tárikh-i-Mushtáqi*, F 69b *et seqq*.

spread over Western Europe. The asylum and hospital 'Les Quinze-Vingt' was founded in Paris by Louis IX after his return from his unhappy Crusade in 1254-60. Originally intended for three hundred poor blind men, it had added to it later a hospital for eye-diseases which is now one of the most important in the French capital." [1]

Even to-day the division of the big hospitals in England and other places in Europe into two main sections of outdoor and indoor departments, and of the latter into various wards for the patients of different diseases, the general method of examination and attendance, and of the visits of the senior physicians on the fixed days of the week and of having seperate rooms for dispensary, for pharmacy and for stores, all are legacies of the medieval Islamic hospitals. "The Arab system", says Elgood, "can be seen in practice any day of the week in any large London hospital to-day." [2]

V

Arabian Medicine in Modern India

Arabian Medicine was introduced into India about the end of the twelfth century. Since then it has been flourishing throughout the length and breadth of the country, side by side with the other ancient and modern systems of medicine. Even to-day thousands of physicians are practising it with success in every part of this large sub-continent. Thousands of people of every class, are being treated and relieved of their ailments by them. Since the beginning of the present century official schools and colleges have been established in various provinces for teaching it. There are such official institutions in Patna, in Allahabad, in Lucknow, at Aligarh, in Delhi, in Hyderabad, at Bhopal, in Bombay, in Madras, and perhaps at some other

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[1] *Legacy of Islam*, pp. 349-50.

[2] *A Medical History of Persia*, p. 178.

places also. The most important of them is the "Ayurvedic and Unáni Ṭibbí College" of Qarole Bagh, Delhi, which was founded by the reputed physician, Ḥakím Md. Ajmal Khan of revered memory and was opened by Mahatma Gandhi in 1921 A.D. In Pakistan also there are similar institutions in several towns like Dacca, Lahore etc. Over and above these official Ṭibbí Schools and Colleges, there are numerous private institutions also in which the subject is taught by learned physicians. An important example of them is the Takmílu'ṭ-Ṭibb of Lucknow. To each of these medical institutions is attached a dispensary for the outdoor patients and to some of them are also attached hospitals for indoor patients. There are also some highly flourishing Ṭibbí pharmacies in Delhi and at some other places which prepare various kinds of medicaments according to the Arabian system. The best known of them are the "Hindustáni Dawákhána" and the "Hamdard Dawákhána" of Delhi. Some of their products are taken over by some of the modern American and European pharmacies and are reproduced by them in modernised form. An important example of them is the "Dawáúsh-Shifá" of the Hindustáni Dawákhána which has been reproduced in modern modified form under the various names like Serpasil etc., by modern pharmacies of America and Europe. The Dawáúsh-Shifá was used with success, by the late Ḥakím Ajmal khan (after whose name have been designated Ajmaline and Ajmalinine—two of the alkaloids of Rauwolfia Serpentina), and the other physicians, for nervous and brain ailments as well as for the symptoms of blood pressure. Its ingredients consisted of Rauwolfia Serpentina one part and of pepper one-eighth part. Rauwolfia Serpentina which is known in Patna district of Bihar as 'Israul' has been identified with Rasana of the ancient Indian physicians and has been mentioned by ar-Rází, Avicenna, Ibnu'l-Bayṭár and other Arabian physicians and botanists as 'Rásan' or Rásan-al-Hindi.[1]

[1] This plant has been thoroughly and critically discussed by Dr. J. K. Majumdar in a monograph which may be published soon.

The great success of all these institutions, however, shows the importance as well as the practical utility of them even in modern times and proves that Arabian medicine is neither hated nor has it been given up by the Eastern people.

VI

The Present Book

Edition of the *Firdausu'l-Ḥikmat*.

The present work was taken up simultaneously with the edition of the text of the *Firdausu'l-Ḥikmat*, at the suggestion of the late Prof. E. G. Browne of Cambridge and was meant to serve as its introduction. It was completed in 1925 except the chapters IV and VII which were added to it recently. But it could not be printed up till now due to various reasons. The contents of the chapters V and VI, however, were utilized by me in writing the Arabic introduction to the text of the *Firdausu'l-Ḥikmat* which was published by Sonne Press of Berlin in 1928.

Its criticism by eminent Orientalists.

This book attracted the serious attention of several eminent Orientalists. Max Meyerhof wrote two long articles on it, one of which was publised in the *Z.D.M.G.* of 1931 (pp. 38-68) and the other in the *Isis* of 1931 (Volume 16, pp. 6-54). Carl Brockelmann published a detailed criticism of it in the *Zeitschrift f. Semitistik* in 1932 (pp. 270-88). Alfred Siggel publised an annotated German translation of part VII, discourse IV, chapters 1-34 of the book which deal with the Indian system of medicine, in the Abhandlung of the Academy of Science and Literature of Mainz (1950). Otto Spies reviewed this translation in the *Z.D.M.G.* of 1953 (pp. 216-18). And A. Spitaler published a detailed critical estimate of the translation in the *Orientalistische Literaturzeitung* 1953 (cols 529-36).[1]

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[1] I am indebted to Prof. O. Spies of Bonne, to Prof. A. A. Cense of Istanbul and to Prof. A. Kessen of Leyden, for the photostat copy of the articles of Profs. C. Brockelmann and of A. Spitaler.

Meyerhof's articles.

Meyerhof in his scholarly article in the *Z.D.M.G.* commented upon the life and works of 'Alí b. Rabban, mainly on the basis of the materials collected together by me in the Arabic introduction to the *Firdausu'l-Ḥikmat*, adding to them, certain results of his own researches. He pointed out that the date of 'Alí b. Rabban's birth suggested by me, was about thirty years earlier than the probable one, and that my statement that Abu Bakr Zakaríyyá ar-Rází studied medicine at Ray with 'Alí b. Rabban, based on Ibnu'l-Qifṭi and Ibn Abí 'Uṣaybia, was wrong. It was not possible that ar-Rází who lived from 865-925 A.D. and began his study of medicine at the ripe age of 30 years, could have studied the subject with 'Alí b. Rabban who was born not later than 810 A.D. (*Z.D.M.G.* 1931, p. 47). Meyerhof is correct in fixing the date of the birth of 'Alí b. Rabban about the year 810 A.D., but his opinion that ar-Rází could not have studied medicine with 'Alí b. Rabban, based on a treatise by al-Biruní, published by J. Ruska in the *Isis* Vol. V (1923, p. 32 *et seqq*) which lays down the birth and death of ar-Rází in 865 A.D. and 925 A.D. respectively, is open to question. For the date of the death of 'Alí b. Rabban is not known, and it is not impossible that he lived till after 895 A.D., and delivered lectures on medicine to ar-Rází and others at Ray or in Baghdad, after the death of Al-Mutawakkil (861 A.D.), when the court of the Caliph had lost its power and attraction. It is true that being born in 865 A.D. ar-Rází could not have studied with Alí b. Rabban at Ray about 842 A.D. (and my statement at page II (ب) of the Arabic introduction of the *Firdausu'l-Ḥikmat* must be corrected) but it is not impossible that he studied with 'Alí b. Rabban at a later period. As a matter of fact, the extra ordinary interest of ar-Rází in the Indian system of medicine like that in the Greek system, and his tendencies in the treatment of individual cases and in dealing with the various medical problems in his different works, appear to be so much influenced by those of 'Alí b. Rabban that Meyerhof himself is compelled

to remark that "it is only in this sense that ar-Rází may be said to be a student of 'Alí b. Rabban" (*Z.D.M.G.* 1931, p. 68). Considering these facts, the unanimous statements of the early Arabic writers cannot be set aside lightly. It is probably on account of this that Brockelmann in his article which he published a year after the publication of Meyerhof's article, has reproduced the substance of what I wrote about ar-Rází's study of the Science of medicine with 'Alí b. Rabban without making any comment on it (*Z. f. Semitistik* 1932, p. 270). In the other article, however, Meyerhof reproduced in English a part of what he published in German in *Z.D.M.G.*, gave a detailed account of the contents of the *Firdausu'l-Ḥikmat* and added to it an index of some of the technical terms and medicaments. He also published in the *Isis*, Vol. 23 (2) of 1935, the text and the English translation of the clinical cases of ar-Rází mentioned by him in one of the volumes of *al-Ḥáwí*, on the basis of its manuscript preserved in Bodlian Library at Oxford (3 Marsh 156).[1] These materials form part of chapter VI and of the three appendices of this book. Meyerhof might

[1] There are some inaccuracies in the text as well as in the translation of the accounts of clinical cases published by Meyerhof. In case No. VI (Arabic text, p. 4. Eng. tr., p. 336), for example, the words بعض السائين, rendered by Meyerhof as "One of the diauretic water" should be translated as 'Ward boy'. In the same case and pages وكان سبباً (not شيئاً). لعقن البول, rendered as "and there was something else obstructing the urine" should be "which was the cause of the obstruction of the urine". In case No. XV (Arabic text, p. 8 Eng. tr., pp. 340-41) the Arabic text:

" فمالت المرّة (not المرأة) فيما احسب الى الراحة فبردت اطرافها "

translated by Meyerhof as "but this woman was inclined to rest, as I believe, and allowed her extremities to become cold," should be translated as "the matter moved towards the palm, as I think, and therefore, her extremities (palms) became cold." In case No. XXIII of Meyerhof الاستسقاء in the last line should be rendered as dropsy and not as pregnancy. Certain other parts of the Arabic text as well as of the English translation are also, I venture to say, open to question.

have been saved of some of the labours which he had taken in writing these articles, if this little volume had been published simultaneously with the *Firdausu'l-Ḥikmat*. There are, however, a great deal of additional matters in these parts of the present volume, and therefore, I thought it advisable to publish them even after the publication of Meyerhof's articles.

Brockelmann's criticism.

Carl Brockelmann in his learned and valuable article gave a short account of the life and works of 'Alī b. Rabban and of the contents and sources of his *Firdausu'l-Ḥikmat* mainly on the basis of my introduction to the printed text and rightly pointed out that I had failed to mention in the list of his works the name of his book *Kitābul-Iḍāḥ* to which the author himself has referred in the *Firdausu'l-Ḥikmat* (p. 113). He accepted my identification of the quotations in the *Firdausu'l-Ḥikmat* with the text of the *Kitābul-Filāḥat* of Ibnu'l-Waḥshiyya, and suggested that these quotations must have been taken from an earlier Arabic translation of the *Kitābul-Filāḥat* which might be discovered in some of the libraries in the East. He identified the quotations from the *Kitābu-Ṭabā'il-Ḥayawān* (*Firdausu'l-Ḥikmat*, p. 534) with passages in *Anecdota syr* (ed. Land IV, 68, 11).

He described my edition of the *Firdausu'l-Ḥikmat* and pointed out its defects and regretted that it did not contain the indices of the medical terms and of the medicaments, which would have been of immense value in determining the history of the development of medical terminology in Arabic and the influence of Syriac medical nomenclature on it, which, according to him, is great and extensive. This he has tried to prove by quoting the term 'as-Sanwartā' and the Arabic terms for the three kinds of Dropsy and the terms for a few medicaments which are identical with the Syriac terms (p. 277).

He has mentioned a large number of misprints and mistakes in the published text of the book, partly independently, partly by collating certain part of it with the text of a book on the eye

by Ḥunayn b. Isḥáq (*Maqálátu-Ḥunayn*) which has been edited by Meyerhof, and partly by collating certain other parts of it with an undated but pretty old manuscript of the *Firdausu'l-Ḥikmat* which was acquired by the staats-bibliotbek of Berlin in 1930 and could not be utilised by me. The learned Orientalist is of opinion that the new Berlin manuscript represents another recension of the *Firdausu'l-Ḥikmat*, different from that of the other four manuscripts which were utilised by me in editing its printed text. He suggested that a new critical edition of the book for which there are now ample materials available, would be of great literary and scientific value.

A. Spitaler's review.

A. Spitaler in his review of the German translation of a part of the *Firdausu'l-Ḥikmat*, published by Siggel, has vainly identified some of the Sanskrit terms, and pointed out many mistakes of the translator, which according to him, are partly due to the badly printed Arabic text and partly due to the inability of the translator to render into German appropriately the technical and philosophical Arabic text, and joined with Brocklemann in expressing the desirability of a new edition of the book.

New edition of *Firdausul-Hikmat* desirable.

The general criticism against the printed text of the *Firdausu'l-Ḥikmat* by these learned Orientalists must be accepted. As a matter of fact, I have myself expressed my own dissatisfaction with it, in its introduction (pp. كح - كط xxviii-xxix) and the desirability of a new critical edition of the book cannot be doubted. In this new edition of the book its text must be collated not only with its four manuscripts in Europe but also with the two other Indian manuscripts of it; one of which is in Lucknow and the other in the Riḍá-Library of Rampur,[1] both of which are complete and in good condition, and have been in the posses-

[1] I am indebted to Mr. Imtiyaz 'Ali 'Arshi, the librarian of Riḍá Library, for the following description of the Rampur manuscript:—

The manuscript consists of hundred and eighty-two folios, each folio being of $12'' \times 6\frac{3}{4}''$ and the written space being $9'' \times 3\frac{3}{4}''$. The folios 1a to 5b

sion of some learned Indian physicians. Some of the above criticisms, however, will be met by the publication of the present volume. For, the appendix 2 contains the names of a large number of medicaments occurring in the *Firdausu'l-Ḥikmat* together with the references to the relevant parts of the books of Dioscorides and Ibnul-Bayṭàr, and appendix 3 gives the anatomical, pathological and other technical terms together with their equivalent Greek terms in most cases. These appendices on the one hand largely fulfilled the desire expressed by Brockelmann in his article (p. 277) for the index of such terms in the printed edition of the *Firdausu'l-Ḥikmat*, and on the other hand, they show that in the developement of the Arabic medical terminology, Syriac medical nomenclature did not play such an important part as Brockelmann thinks. As-Sanwartá is probably the only Syriac pathological term used in the *Firdausu'l-Ḥikmat*. The terms for the three kinds of Dropsy are derived from roots which are generally used in Arabic. To quote them, as examples of the influence of Syriac terminology on Arabic terminology, therefore, cannot be justified in spite of the fact that these very terms have been used in the *Syriac Book of Medicine* (edited and

This volume meets the above criticisms.

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consist of the list of the contents and were added to the manuscript at a later date. The manuscript begins on folio 6b and ends on folio 182b. On folio 44a and 129b certain parts of the text which were left out by the scribe, have been supplied on the margin. The manuscript is written on brown Kashmiri paper in ordinary naskh (نسخ) in black ink, the headings being in red ink, each page consisting of twenty-six lines. The exact date of copying the manuscript is not given. But it appears from the seals of one of its owners, Masihuddaula Ḥakím 'Alí Ḥossain Khan Bahadur on folios 1b and 182b, which bear the date 1262 A.H./1846 A.D., as well as from the paper and script of the manuscript that it was copied not earlier than the 2nd quarter of the 19th century. But it was badly kept and, therefore, its margins were generally damaged and worm-eaten. They have been, however, repaired recently. The manuscript bears many verbal mistakes of scribe but it is complete and is sure to be helpful in correcting the mistakes in the printed text of the book.

translated into English by Sir E. A. W. Budge). Of course, the influence of Syriac medical literature on Arabic medical literature cannot be denied, for several medical books were translated into Arabic either from or through the books in Syriac.

Its scope and subject matter.

In this little volume, however, an attempt has been made to give a brief account of Arabic Medical Literature till the compilation of the *Firdausu'l-Ḥikmat* to discuss the life and works of its author in detail, to show the interests of the Muslim kings, the noblemen and the scholars of India in Indian science and culture in general and in the Indian system of medicine in particular, and to describe and discuss fully two of the earliest medical books written in Persian in India on the basis of the important works of the ancient Indian physicians on the subject. Its perusal will show that it throws new light on several old problems concerning Arabic and Persian medical literature, discusses several new problems regarding Persian medical literature produced in India and opens new field of research for scholars interested in the subject. It is the result of hard work of several years which was interrupted now and then by other pre-occupations. I will consider my labours well rewarded if it inspires some of the young scholars to do further research on the subject.

CHAPTER I

The Medicine of the Arabs in the pre-Islamic and the Theocratic Periods

The Arabs got the science of medicine from their conquered races

The Arabs, like the Romans, derived the science of medicine from their conquered races, the Syrians, the Persians and others, together with many paraphernalia of refined and luxurious life, all of which they adapted according to the ideas which were infused into them by their newly revealed religion : Islam. The ancient Arabs had no idea of medicine as a science even in its most elementary stage.

The causes which prevented the evolution of medical science in Arabia.

Apart from the want of general culture, there were also other natural causes which prevented the evolution or adoption of any system of medicine in ancient Arabia. Simple habits of life in the desert, constant wandering in the open air, in quest of scanty herbage and water, perpetual strife between the different tribes, and some outstanding qualities of the pre-Islamic Arab, such as "bravery in battle, patience in misfortune, protection of the weak and defiance of the strong",[1] hardened, from youth, the physique of a race fundamentally sound and healthy. The outbreak of epidemics among them was extremely rare, and chronic diseases were almost unknown. Hence the necessity for a system of the healing art was not felt in the life of the Arab of the pre-Islamic period.

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[1] Dr. R. A. Nicholson, *Literary History of the Arabs*, 1923, p. 79.

Disease in Arabia, and its description in pagan Arabic literature.

None the less, certain parts of Arabia seem to have been well known among the ancient Arabs as haunts of fever.[1] We find references to such places and their fever and its peculiarities in the pre-Islamic poems. Muraqqish the Elder says in one of his *Nasíbs* (love-poems) :—

دقاقُ الخصورِ لم تعفّرْ قرونُها لشجرٍ ولم يحضرنَ حمّى المزالفِ [2]

Tr. "Slender of waist are they : their tresses have never been defiled with dust by reason of any distress nor have they ever dwelt in the fever-haunted villages of the low-lands."[3]

Akhnas b. Shahâb says :—

ظللتُ بها اعرى و اشعر سخنةً كما اعتاد محمومًا بخيبر صالبُ [4]

Tr. "Day-long I stood there while swept me a tremor and burning heat as a vehement hot fit comes on a sick man in Khaybar town."[5]

Shammákh, a Mukhaḍrim poet says :—

كأنّ نطاةَ خيبرَ زوّدتْه بكورِ الورد ريّثةَ القلوعِ [6]

Tr. "As though Niṭát, a village of Khaybar, supplied him with fever the fits of which come early in the morning and abate slowly."

When we put all these details together, we have a good description of the peculiarities of the fever which was perhaps common in Khaybar : that it used to come with vehement hot fits, that its usual time was early morning, that it was attended with rigor and sweat, and that it abated slowly.

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[1] See Sir Charles Lyall's translation of *al-Mufaḍḍaliyyát*, p. 151, note 2.

[2] *al-Mufaḍḍaliyyát* ed. Ch. Lyall, Vol. 1, p. 474.

[3] *Ibid.*, Vol. 2, p. 174, No. 9. In connection with all quotations from *al-Mufaḍḍaliyyát* we have given the translation of the same celebrated Orientalist.

[4] *Ibid.*, Vol. 1, p. 411.

[5] *Ibid.*, Vol. 2, p. 149, No. 2.

[6] *Ibid.*, Vol. 1, p. 411.

Names of drugs.

Numerous references to the names of plants, their flowers and seeds like قرنفل clove, فلفل pepper, الأثل tamarisk, الايدع dragon's blood, الأرطى calligonum, العنصل scilla, etc., occur in the odes of the ancient Arabs. But in them, we find no allusions to the medical properties of these substances, such as occur in a much later Persian poem, the famous *Mathnawí* of Jalálu'd-Dín Rúmí. We may, then, be justified in concluding from all this that even popular medicine was not much developed in Arabia of the pre-Islamic period. This is corroborated by some of their proverbs, for instance آخر الدواء الكيّ Cauterization is the last remedy, الى ان يجئ الترياقُ مِن العراق مات المسلوعُ the snake-bitten person will die till the antidote is brought from Mesopotamia.[1]

Pre-Islamic Arab physicians.

But there were physicians in Arabia even in this period. The Banu-Muḥallab, a tribe of pagan Arabs, were famous among them for the treatment of hydrophobia produced by dog-bite.[2] Ibn Abí Ramtha, a surgeon who lived till the time of the prophet Muḥammad, is mentioned by Ibn Abí 'Uṣaybi'a.[3] But considering the general condition of the country and the culture of its people, we may be sure that these men possessed no scientific knowledge of medicine nor did they even know how to read and write. They knew the names of certain drugs

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[1] The last proverb does not seem to be of Arabian origin. As the proverbs are considered to be an important source of information about all aspects of pagan Arab life (Dr. Nicholson's *Lit. Hist. of the Arabs*, 1923, p. 31), we went through the whole of al-Maydáni's *Majma'u'l-Amthál*, but did not get any considerable result. We found therein, however, proverbs like رماه الله بداء الذئب, به داء الظبي, some of which may have served the early translators of medical works into Arabic, as types according to which they coined such pathological terms as داء الثعلب, داء الحية, داء الأسد etc.

[2] *al-Mufaḍḍaliyyát*, Vol. 1, p. 543.

[3] *Ṭabaqátu'l-Aṭibbá*, Vol. I, p. 116.

and perhaps some of their properties and applied them indifferently in all cases that came before them.[1]

Women as nurses.

Nursing and tending the sick seems to have been a part of the duties of women even in ancient Arabia. We find a reference to it in the poem of Muzarrid b. Ḍirár, a Mukhaḍram poet. He says :—

أَلا يا لقومِ و السفاهةُ كاسمها أعائدتي من امّ سلمى عوائد [2]

Tr. " Help O my people ! Folly is (hateful) as her name : are the sick nurses to tend me time after time because of my love for 'Ummi-Salma." [3]

The influence of the advent of Islam on the Arabs.

By the advent of Islam, the Arabs were brought in close contact with the non-Arab races and civilised nations of the world, at first, through the magnetic personality of Muḥammad and afterwards by successive conquests. Thus, partly through the teachings of the prophet and partly through exchange of ideas with more civilised peoples, the whole outlook of the Arabs on life was changed. The standard of culture was raised, knowledge was considered as a great asset and its cultivation formed a part of religious duty. Some of the Arabs who used to look down upon foreign tongues learnt languages that were not their own. Zayd b. Thábit learnt Hebrew [4] and Mughira Persian.[5] Schools were opened in all parts of the Caliphate [6] and reading and writing of the *Qur'án* was made compulsory, for every Muslim.[7]

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[1] The same remarks with some modification have been made by Dr. F. Malmejac about the Arab physicians of the present day, *La Nature*, Paris, 1901, p. 231.

[2] *al-Mufaḍḍaliyyát*, Vol. 1, p. 127.

[3] *Ibid.*, Vol. 2, p. 44, No. 9. *Cf.* Dr. Nicholson's *Lit. Hist. of the Arabs*, 1923, p. 59.

[4] *Futúḥu'l-Buldán*, ed. De Geoje, 1886, p. 474.

[5] *Annals* of aṭ-Ṭabarí, series 1, Vol. 5, p. 2560.

[6] Ibnu'l-Jauzí *Siratu-'Umar* b. Khaṭṭáb. This reference was based on the works of Shiblí, but when we consulted the book of Ibnu'l-Jauzí, we found that it was quite unfounded.

[7] *Kitábu'l Aghání*, Vol. 16, p. 58.

Its influence on the popular medicine of Arabia.

Though these changes were mainly confined to the ethical, theological, and political aspects of life, yet under the influence of these changes the popular medicine of Arabia developed a great deal, as it appears from the literature of this period, of which the *Qur'án* and *Tradition* formed the most important parts.

Medicine in the Qur'án and Tradition.

In the Qur'án we find some description of Embryology,[1] of physiological actions[2] and some therapeutic recommendations.[3] Some hygienic principles are described in detail and emphasis is laid on their observance.[4] In Tradition we find that the science of medicine has been recognised[5] and put on the same level with Theology[6]; the principles laid down in the Qur'án are described with greater details. Some actual cases came before the prophet, and his therapeutic recommendations are preserved.[7] Thus we find in Tradition a number of new pathological terms like جذام, tubercular leprosy, ذات الجنب Pleurisy, etc. and the names of some new therapeutics agents, like قسط, kostus, عود هندي, Agallochi, اثمد, Antimony, شيونيز, Nigella Sativa, etc.[8] which do not occur in the literature of the pre-Islamic period.

Medical practitioners of this period.

There were many physicians living in Arabia in this period. The names of four Ḥárith b. Kalada, Naḍr b. Al-Ḥárith, Ibn Abí Ramtha, and Zaynab, a woman eye-doctor, are mentioned by

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[1] *Qur'án*, 23. 12-14, etc.

[2] *Ibid.*, 12. 31; 16. 60 etc.

[3] *Ibid.*, 38. 40-41; 16. 71.

[4] Medicine in the *Qur'án* has been dealt with in detail by Karl Opitz in his book "*Medizin im Qur'án*". Stuttgart, 1906.

[5] ما انزل الله داءً الا انزل له شفاءً Bukhárí, *Kitábu'l-Ṭib*.

[6] العلم علمان علم الأديان و علم الأبدانِ

[7] See Bukhárí, *Kitábu'l-Ṭib*.

[8] *Ibid.* This part of Tradition has been dealt with in detail by Leclerc (*Hist. de. la. Med. Ar.*) and summarized by Professor Browne (*Arabian Medicine*, pp. 12-13).

Ibn Abí Uṣaybi'a.[1] Wüstenfeld, in his *Geschichte der Arabischen Ärzte*,[2] has added to this list the name of one Abu Ḥafṣa Yazíd. In the *Annals* of al-Ṭabarí, and *al-Kámil* of Ibnu'l-Athír, we find references to two other physicians: a certain member of the tribe of Banú Ḥárith who had treated the death-wound of 'Umar the 2nd Caliph[3] and Abú Bakr b. Ḥafṣ, who was called in for the treatment of Abú Bakr, the first Caliph.[4] Al-Ṭabarí also says that 'Umar had sent many physicians to Qádisiyya.[5] Ibn Heshám (p. 688) has mentioned the name of a woman Rufaydah as a surgeon. And the tribe of Banu Abjar has been mentioned in *Kitábul-Ma'árif* (p. 32) as practising the healing art at Kufa.

Ḥárith b. Kalada.

Of these numerous medical men Ḥárith b. Kalada was the only well-educated physician trained in the healing art. He was born probably about the middle of the fifth century, at Tá'if, in the tribe of Banú Thaqíf. He travelled through Yaman and Persia where he learnt Music and received his education in the medical science in the great medical school of Jundisháپúr. Having completed his studies he practised as a physician in Persia and made much money by means of his profession. During this time he was called to the court of king Chosroes, with whom he had a long conversation.[6] He came back to Arabia about the beginning of Islám and settled down at Tá'if, where Abu'l-Khayr, a king of Yaman, came to see him, in connection with

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[1] *Ṭabaqátu'l Aṭibbá*, Vol. 1, pp. 109-16.

[2] Göttingen, 1841, p. 9.

[3] *Annals* of al-Ṭabarí, series 1, Vol. 5, p. 2725.

[4] *Ibnu'l-Athír*, Vol. 2, p. 324.

[5] *Annals* of al-Tabarí, Vol. 1, p. 2225.

[6] This conversation has been preserved in the form of a treatise which was written by Ḥaytham b. 'Adí in the Berlin library (Ahlwardt's *catalogue*, Vol. 5, No. 6246). The conversation is also reported by Ibn Abí Uṣaybi'a, almost fully (*Ṭabaqátu'l-Aṭibbá*, Vol. 1, pp. 110-12). To me its authenticity is doubtful.

a certain disease from which he was suffering and, on being cured, rewarded him with much money and a slave girl.[1] He died in the reign of 'Umar the 2nd Caliph.[2]

His views about medical problems.

Though Ḥárith b. Kalada did not write any book on medicine,[3] yet his views on many medical problems are preserved in his conversation with Khusrau to which we have already referred. Though this conversation deals mainly with the hygienic principles,[4] yet it also contains his views on the nature of physical bodies, the principle of the treatment of diseases, the constitution of the eye and on sight. He holds the theory of the four humours, and the principle of the treatment by contraries. According to him, medicine should be avoided when possible, and the use of clysters is the best remedy for stomach-troubles. About the eye he says that it is constituted of fat, which is the white part, of water, which is the black part, and of wind, which constituted the eyesight.[5] All this, bizarre as it may seem to us, goes to show the acquaintance of al-Ḥárith with the Hippocratic system.

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[1] Ibn Khallikán ed. Wüstenfeld, No. 831, p. 23.

[2] Ibn Qutayba. *Kitábu'l-Ma'árif* ed. Wüstenfeld, 1850, p. 147: Ibn Durayd's *Kitábu'l-Isʾtiqáq* ed. Wüstenfeld, 1354, p. 185. *Cf.* aṭ-Ṭabarí, series 1, p. 2127; Abu'l-Fidá, Constantinople, 1870, Vol. 1, p. 167. Ibnu'l-Qifṭí and Ibn Abí 'Uṣaybi'a say that Ḥárith b. Kalada lived till the time of Mu'áwiya (*Taʾríkhu'l-Ḥukamá*, p. 161, *Ṭabaqátu'l Aṭibbá*, Vol. 1, p. 110).

[3] Ibn Abí 'Uṣaybi'a says that one of the works of al-Ḥárith is his "Book of Conversation with Khusrau" (*Ṭabaqátu'l-Aṭibbá*, Vol. 1, p. 113). Wüstenfeld probably relying upon Ibn Abí 'Uṣaybi'a says, "Er soll ein medizinische handbuch geschrieben haben" (*Register zu den Genealogischen Tabellen*, Göttingen, 1853, p. 211). But to us the statement of Ibn Abí 'Uṣaybi'a seems to be erroneous because the earlier authorities have not mentioned any work of al-Ḥárith and the "Book of Conversation" was written in the 'Abbásid period, see note 4, p. 8.

[4] Summarised by L. Leclerc *Hist. de la Med. Ar.*, Vol. 1, p. 27.

[5] *Ṭabaqátu'l-Aṭibbá*, Vol. 1, pp. 110-12.

Other physicians.

Some of the medical men mentioned above [1] like Naḍr b. al-Ḥárith [2] and Abu Ḥafṣa Yazíd [3] are wrongly described as physicians by later Arabic writers on whose authority some modern Orientalists [4] also have mentioned their names among the physicians of this period. Others like Abú Bakr Ḥafṣ, and the physicians that were sent by 'Umar to Qádisiyya, were probably only quacks, concerning whose education in the medical science we have not received any report.

Exaggeration of some Orientalists.

The importance of some of the Arab physicians of this period and their influence on the cultivation of medical science in Arabia, have been greatly exaggerated by some Orientalists. Thus

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[1] See *supra*, pp. 5-6.

[2] Naḍr b. Ḥárith, a Qurayshite and cousin of the prophet Muḥammad had been to Ḥira, where he visited the court of Khusrau. He had learnt music and introduced it among the Quraysh at Mecca. (*Murúju'l-Dhahab*, Vol. 8, pp. 93-94). He also used to read Persian (*Ibnu'l-Athir*, Vol. 2, p. 55). But none of the early Arabic authorities refer to him as a physician. Ibn Abí 'Uṣaybi'a is the first Arabic writer to say that he was a physician (*Ṭabaqátu'l-Aṭibbá*, Vol. 1, pp. 113-16). But he says that Naḍr learnt medical science with his father al-Ḥárith, the physician which is erroneous, because Ḥárith b. 'Alqama, the Qurayshite, and the father of al-Naḍr was neither a physician nor a learned man and Ḥárith b. Kalada, the physician, had no son named al-Naḍr, see *infra*, p. 9. *Cf. Die Genealogischen Tabellen der Arabischen Stämme*, Göttingen, 1853, G. 1.

[3] Abu Ḥafṣa Yazíd has not been mentioned as a physician by any of the early authorities. Ibn Qutayba has written a short notice on him (*Kitábu'l-shi'ri wa'l-Shu'ará*, ed. De Goeje, p. 481). A long article on him is found in *Kitábu'l-Aghání* (Vol. 9, pp. 36-48). But none of them says that he was a physician. Ibnu'l-Qifṭí and Ibn Abí 'Uṣaybi'a do not mention his name at all. Ibn Khallikán is the first writer who says و قيل ان ابا حفصة كان طبيبا يهودياً اسلم (It is said that he was a Jewish physician and embraced Islam), ed. Wüstenfeld, No. 726. This sentence about Abu Ḥafṣa with some changes and without the word طبيباً occurs in the *Kitábu'l-shi'ri-wa'l-Shu'ará*, و يقال ان يحيى بن ابى حفصة كان يهودياً اسلم as well as in *Kitábu'l-Aghání* (انه كان يهودياً اسلم, Vol. 9, p. 36). From this we may conclude that the word طبيباً is a later interpolation.

[4] Wüstenfeld, *Geschichte der 'Arabischen Arzte*, p. 9.

L. Leclerc says that Ḥárith b. Kalada, on his return from Persia, imparted his medical knowledge to a number of students among whom were included his son al-Naḍr, and the prophet Muḥammad, and but for the religious and political upheaval in the country, he would have been the chief of a medical school in Arabia, the importance of which is difficult to realise.[1] Again with as little justification Shiblí, one of the greatest Orientalists that India ever produced, says that al-Naḍr the son of al-Ḥárith advanced the Medical science in Arabia a great deal.[2]

It is unfounded.

These assertions are without any historical foundation, and to a great extent, if not entirely, even against it. Al-Naḍr who has been mentioned, by Ibn Abí Uṣaybi'a, as a physician, probably on the basis of his assumption of a false relation between him (al-Naḍr) and Ḥárith b. Kalada, was really the son of Ḥárith b. 'Alqama who has not been mentioned as a physician by any historian.[3] We have not received any other report of the education of al Naḍr in the healing art, nor of Ḥárith b. Kalada's delivering regular or irregular lectures on the medical science. Arabic grammar and scientific Arabic prose which alone could have served as a medium of instruction had not yet developed sufficiently for this purpose. Any serious cultivation of science was almost impossible in the cloudy political atmosphere of Arabia, in the theocratic period, when the whole energy and intellect of the people was devoted to one single idea : the construction of the rising power of Islam. The failure of the authorities to send any medical aid for the Muslim warriors, when an epidemic broke out in their camp, in Syria, and the treatment of the death-wound of 'Umar the 2nd Caliph with milk and wine (نبيذ)[4] also show that the medicine of the Arabs in this period had no scientific basis.

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[1] *Hist. de la Med. Ar.*, Vol. 1, p. 26.

[2] *Rasá'il-i-Shibli*, 'Aligarh, 1893, p. 2.

[3] See f. n. p. 8.

[4] *Annals* of al-Ṭabarí, series 1, Vol. 1. 5, p. 725.

Popular medicine developed.

Though Medicine as a science remained unknown to the Arabs till the advent of the Umayyads, and *Arabian Medicine* did not come into existence till then, yet the popular medicine of Arabia, as we have seen, made much advance in the theocratic period, possibly on account of the presence of Ḥárith b. Kalada, and was circulated by means of the Qur'án and Tradition, which according to Wüstenfeld were the basis of all the scientific activities of the Arabs in the following period.[1]

[1] *Arabische Acadamien*, Gottingen, 1837, pp. 1-2.

CHAPTER II

The Umayyad Period

Literary activities.

As in the theocratic period, in spite of the unfavourable conditions—conquests, expansion of the commonwealth, and its organisation—the seeds of every later political and intellectual development in the history of the Arabs were sown, so in the early Umayyad period, in spite of the civil strife, all these seeds germinated and took definite forms. The new conditions in this period gave rise to new results. In this period arose all the important sects in Islam; Arabic grammar and prose literature were founded and developed on a firm basis; various departments of the state were organised, and their records were translated into the Arabic language; certain towns in the Islamic commonwealth, on account of their peculiar conditions and past history, became centres for the different branches of learning—Baṣra was the centre for grammatical and philological studies, Damascus was celebrated for history, theology, and literature, while Medina maintained its position with regard to Tradition and Law.

Interest in science and its main cause.

In this intellectual movement of the Arabs and the development of the various branches of Arabic literature, the sciences could not be altogether neglected. The interest of the Arabs in science was excited by the transference of the Capital from Medina, where no non-Arab was allowed to settle,[1] to Damascus, one of the old seats of Greek learning and by their settlement in the different parts of the Islamic commonwealth where they came in close contact with Christian and Jewish savants, some of whom were employed by some of the Umayyad Caliphs and their Governors. The interchange of ideas attracted and influenced the minds of the Arabs and found expression in the development of the sciences.

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[1] *Murûju'l-Dhahab*, ed. Meynard, Vol. 4, p. 226.

Khálid, the first scientifically minded Arab.

The first Arab who took an active interest in the sciences was the grandson of Mu'áviya I, Abú Háshim Khálid b. Yazíd, the most influential Arab prince of his time.[1] Being brought up in the court of Damascus, in company of Christian savants, Khálid acquired a taste for scientific studies which he followed with great zeal and energy. He collected some of the learned men of Egypt, which possessed the greatest centre of medical learning at that time,[2] studied Medicine and Alchemy with them, and asked them to translate books on Medicine, Astronomy and Alchemy, from the Greek and Egyptian languages

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[1] Shiblí, says that Mu'áviya I got some medical books translated into Arabic by Ibnu'l-Athál, his court physician. (*Rasáil Shibli*, Aligarh, 1893, p. 20). S. Khudá Bakhsh also holds this view (*History of Islamic Civilisation*, Calcutta, 1905, p. 266). But they have not given any authority for this; and we could not find any reference to it in any Arabian history or bibliography.

[2] Some Orientalists have expressed some doubt about the existence of the medical school of Alexandria, at the time of its conquest by the Arabs (Professor Browne's *Arabian Medicine*, pp. 18-19). But almost all the authorities on the subject agree as to the existence of this school at this time. See Dr. Max Neuburger's *History of Medicine*, Oxford, 1910, pp. 327-28; M. G. Matter's *Essai Historique sur le Alexandrie*, Paris, 1848, Book 4, Chapter 24, p. 463; Jean Mespro's *Bib. de L'Ecole des Haute Etude*, Paris, 1924. A passage in the *Ṭabaqátu'l-Aṭibbá of Ibn Abi* Uṣaybi'a shows that the school existed for more than fifty years after the Arab conquest. He says that 'Abdu'l-Malik b. Abjar was in charge of the teaching department of the school in Alexandria before the Arab conquest, After the Arab conquest he accepted Islám at the hands of 'Umar b. 'Abdu'l-'Aziz during his governorship of Egypt. When 'Umar b. 'Abdu'l-'Aziz became Caliph, the teaching was transferred from Alexandria to Antioch, Harrán and other places (*Ṭabaqátu'l-Aṭibbá*, Vol. 1, p. 116). Alexandria seems to have continued to hold some prominent physicians and to have been a centre of some kind of Greek learning even after the advent of the 'Abbásids. From there, Hárún al-Rashíd sent for the physician Boltian (بلطيان) for the treatment of his slave girl who could not be cured by any of his court-physicians (Eutychius' *Nazmu'l-Jauhar*,

into Arabic.[1] The fame of Khálid as an alchemist has overshadowed his activities with regard to the medical sciences. But we know from Ibnu'l-Nadím and Ibn Khallikán that he was interested not only in Alchemy but also in Medicine and Astronomy. Ibn Khallikán says that Khálid had written books on Medicine as well as on Alchemy, had skill in both these subjects and was an authority on them.[2]

Khálid's medical Works.

The medical works of Khálid, as well as the medical works which were translated by the Egyptian savants from the Greek or Qibṭí language into Arabic, under the direction of Khálid, are

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published with Latin translation by Edward Pocock, p. 409; *cf.* Butler's *Arab Conquest of Egypt*, p. 424). There also Ḥunayn b. Isḥáq received his education in the Greek language (*Ṭabaqátu'l Aṭibbá*, Vol. I, p. 189). With this school is connected the question of the identity of John the grammarian, about whom the Arabian and the European authorities greatly differ. Ibn Abí Uṣaybi'a identifies him with John Philoponus. (*Ṭabaqátu'l-Aṭibbá*, Vol. I, p. 104; *cf.* Leclerc's *Hist. d. L. Med. Ar.*, Vol. I, p. 59; M. Steinschneider's *Ar. übersetzungen aus dem Griechichen*, p. 16.) But it has been proved conclusively that John Philoponus did not live at the time of the Arab conquest nor was he a medical man (see Paulys Real, *Encyclopaedia* Stuttgart, 1916, Vol. 9, pp. 1764 *et seqq.* *Butler's Arab Conquest of Egypt*, pp. 405-06, Jean Mespros *Bib. d. L' Ecole d. Haute Etude*, pp. 197-98 footnote). But these authorities mention one John of Alexandria who according to them lived in the 7th century and wrote medical works (*Karl Krumbacher, Gesch, d. Byzant. Lit.*, Munchen, 1897, p. 614). It may be suggested, therefore, that the Arab authorities regarding the two Johns as one ascribed to John Philoponus the works which really belonged to John of Alexandria.

[1] *al-Fihrist*, pp. 242, 354. For the critical study of Khálid and his works see Prof. J. Ruska's excellent book on *Arabische Alchemisten*, pt. 1, Heidelberg, 1924. Professor Ruska holds that the reports of all the historians and bibliographers about Khálid's learning are unfounded. We believe that it has been greatly exaggerated, but finding quotations from his works in later books we cannot say that they are unfounded. In the quotations there occur some words which are not of Arabic origin, but many such words were used by the Arabs even long before the Umayyad period.

[2] *Ibn Khallikán*, Cairo, Vol. I, p. 168.

unfortunately lost. Neither are their names mentioned by the Arab historians and bibliographers, nor does any quotation from and reference to them occur in the extant medical literature. The ability of Khálid as a student of medicine and the merit of the earliest works on the subject, therefore, cannot be judged. Khálid was, however, the first man to write scientific treatises in Arabic verse. Five hundred of these verses were seen by Ibnu'l-Nadím, and some of them are quoted in extant Arabic books.[1]

Other patrons of medical science.

The example set by Khálid was followed by some of the Umayyad Caliphs and their governors. 'Umar b. 'Abdu'l-'Azíz became a patron of 'Abdu'l-Malik b. Abjar, one of the last teachers in the medical school of Alexandria,[2] and of Másarjawayh, a Jewish physician of Baṣra, who translated for him the medical compendium of Ahrún,[3] into Arabic. Ḥajjáj b. Yúsuf had in his service two physicians, of Greek origin, Theodorus and Theodokos. Theodorus wrote three medical works, namely a general compendium and two treatises on pharmacology, and Theodokos instructed students in the healing art, some of whom like Frát b. Shahnáthá lived till the time of the 'Abbásids and became their court physicians.[4]

An unknown medical man.

The name of one Aḥmad ibn Ibráhím, the court physician, of Yazíd b. 'Abdu'l-Malik, has been mentioned by Wüstenfeld as the author of a medical compendium, *Kitábu Uṣúli'l-Ṭibb*

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[1] See *Murúju'l-Dhahab*, Vol. VIII, p. 176, *al-Muktasab fi Zirá'anti'l-Dhahab* ed. Paris. The example thus set by Khálid was followed by many other scientific writers who wrote scientific treatises in verse, e.g., *al-Urjúzatu'l-Sináiya*, of Ibn Sina, on medicine, *Shudhúru'l-Dhahab* of 'Ali b. Músá (Ahlwardt's *Catalogue*) on alchemy. For other Urjuzas see Ḥaji Khalífa ed. Wüstenfeld, Vol. I, pp. 245-47.

[2] *Ṭabaqátu'l-Aṭibbá*, Vol. I, p. 116.

[3] *Tárikhu'l-Ḥukamá*, p. 324.

[4] *Ṭabaqátu'l-Aṭibbá*, Vol. I, pp. 121-23; *Tárikhu'l-Ḥukamá*, pp. 105, 108. Ibnu'l-Qifṭí calls Theodorus Thadhun. *Cf. al-Fihrist*, p. 308.

based on the works of Hippocrates, and of a treatise on pharmacology which contains the names of many drugs passed over by him.[1] Wüstenfeld has based his statement on the Catalogue of the Oriental Manuscripts in the *Bibliotheca Medicea* by Assemanus.[2] In the important Arabian histories and bibliographies there does not occur such a name of any physician of this period. Though it is very difficult to form any definite opinion about these medical works or their authors without seeing the manuscripts, yet it is very unlikely that an Arab physician of this period wrote an independent compendium and based it on the original works of Hippocrates, which were not translated into Arabic before the 'Abbásid period, or that he could have added the names of new drugs to his pharmacology. It may be suggested, therefore, that these books were written by an author of much later date. Abú Ja'far Aḥmad ibn Ibráhím b. Abí Khálid, commonly known as Ibnu'l-Jazzár, the only physician of this name mentioned by Ibn Abí Uṣaybi'a [3] may be taken as the probable author; but the *Kitábu Uṣúli'l-Ṭibb* is not mentioned, in the list of his works by Ibn Abí Uṣaybi'a nor by Hájí Khalífa.

The demerit of the medical works done.

Since the Arabian medical literature of the Umayyad period has been entirely lost, we can form no definite estimate of its merit and value. But we may conjecture that being the first attempt at Arabic scientific prose, it must have had many defects. The language employed could not have been adequate for scientific purposes, nor could the terminology adopted have been precise and exact. This is corroborated by a passage in the *Kámilu'l-Sinā'at* of 'Alí b. 'Abbás, about the translation by Másarjawayh of the medical compendium of Ahrún. He says that "the translation of the book of Ahrún is bad and worthless; many problems, which the author wished to explain, remain obscure

[1] *Gesch. der. Arab. Artze*, Göttingen, 1840, p. 10.

[2] Florence 1742, p. 373.

[3] *Ṭabaqátu'l-Aṭibbá*, Vol. II, p. 38.

to the readers of the translation, especially to those who did not read the translation of Ḥunayn b. Isḥáq and his like." [1]

Foundation of subsidiary institutions.

Apart from Medicine, the subsidiary institutions necessary for the higher development of the medical science were also founded in the Umayyad period. In this period there had come into existence the public and private libraries and the hospitals. 'Umar b. 'Abdu'l-'Azíz ordered that the translation of the compendium of Másawayh should be taken out of the royal library (خزينة الكتب) and published for the benefit of the Muslims.[2] 'Abdu'l-Ḥakím took a house for his companions, furnished it with books, and provided it with chess.[3] Walid b. 'Abdu'l-Malik founded a public hospital, appointed paid physicians to it, and ordered that the lepers should be kept there and provided with food.[4]

It was the result of individual efforts.

Thus we find that the credit of being the founder of Arabian medicine, and of the institutions necessary for its proper development, and of nursing the Arabian sciences in their infancy belonged to the Umayyads. But all done in this period, about Arabian medicine, was the result of isolated individual efforts. The scientific activities of the Arabs did not assume any organised form before the time of the great Hárún al-Rashíd. In the beginning, the civil-war and afterwards, the organisation of the various departments of the state, occupied the minds of the Arabs to such an extent that they could not give any serious attention to the organisation of scientific activities. The whole literature of Arabian Medicine scarcely exceeded half a dozen books. Many important branches of the medical science like Anatomy, Physiology, Embryology, etc. remained altogether untouched.

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[1] *Kámilu'l-Ṣiná'at*, Cairo, p. 4.

[2] *Tárikhu'l-Ḥukamá*, Leipzig, 1903, pp. 324-25.

[3] Ibn Ḥazam's *Jamharutu'l-Nasab*, p. xiv. Fragments from this book are published by S. Khudá Bakhsh, as an appendix to his *History of Islamic Civilisation*, Calcutta, 1905. I got my information from this Appendix.

[4] *al-Maqrizi*, Cairo, Vol. II, p. 405.

CHAPTER III

The Early 'Abbásid Period

The advent of the 'Abbásids marked a new era in the history of the development of Arabian Medicine. When they came to power there arose the magnificent building of Arabian Medicine with all its parts well developed. The rapid rise of this science, in the space of less than two hundred years, can be comprehended only in the light of the collective circumstances that led to it: the previous development of Medical Science by the Greeks and the Indians, the work done in connection with Arabian Medicine and the development of Arabic grammar and scientific prose literature in the Umayyad period, the keen interest of the 'Abbásid Caliphs and their courtiers in literary activities, and the ample means and appliances which they had at their disposal for the promotion of healing art.

The causes of the speedy development of Arabian Medicine in the 'Abbásid period.

All the early 'Abbásid Caliphs from al-Manṣúr to al-Mutawakkil were patrons of learning. Al-Manṣúr was himself a scholar,[1] and being fond of the company of scholars he urged his son, Mahdí, to frequent their society.[2] He took keen interest in Astronomy and other sciences, and also in literature.[3] Mahdí had less taste for scientific studies and was not so broad-minded as his predecessor and successors. Still he was himself a literary man[4] and his generosity towards literary men was unprecedented.[5] Hárún's literary and scientific interest is too well known to need emphasis. His love of literature and sciences was further

The interest of the Caliphs.

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[1] al-Mas'udí, *Murúju'l-Dhahab*, Vol. VIII, p. 292.

[2] *Annals* of al-Ṭabarí, series 3, p. 404.

[3] *Murúju'l-Dhahab*, Vol. VIII, pp. 290-92.

[4] al-Suyúṭi, *Tárikhu'l-Khulafá*, 1857, p. 275.

[5] *Ibn Khallikán*, ed. Wüstenfeld, No. 252; *Kitábu'l-Aghání*, Vol. IX, p. 44.

excited by his acquisition of a large number of books in his campaign in Asia Minor (at the conquest of 'Amúriya and Anqara). To preserve and make the best use of them, he founded the Baytu'l-Ḥikma, organised the library and the translation department, appointed Faḍl b. Núbakht to supervise the translation of Persian books, and entrusted the task of supervising the translation of Greek medical works [1] to Yúḥanná b. Másawayh, who had many assistants under him. Al-Ma'mún organised and sent a commission to Byzantium in order to acquire Greek scientific books.[2] Mu'taṣim approved the strict measures taken by Afshín in regard to the apothecaries' and supplied Yúḥanná b. Másawayh with big monkeys for dissection.[4] Wáthiq's long and interesting discussion with the learned medical men of his time, concerning the principles of the science of medicine, their basis, and the method followed in establishing them, shows his keen interest in medical science and its history.[5] Mutawakkil in spite of his orthodox views, knew the worth of real scholars and did not hesitate to promote learned Christian physicians to the position which they deserved. He had promoted Ḥunayn b. Isḥáq from the position of an ordinary translator to that of the superintendent of the translation department,[6] and made him head of the physicians in Baghdád [7] and he made 'Alí Ibn Rabban al-Ṭabarí who was a secretary of Mu'taṣim, one of his own courtiers.[8]

According to the Arabic proverb الناس على دين ملوكهم "people follow their Kings," the scientific interest of the Caliphs created

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[1] *Tárikhu'l-Ḥukamá*, pp. 255, 380. Cf. *Ṭabaqátu'l-Aṭibbá*, Vol. I, p. 175.

[2] *al-Fihrist*, p. 243.

[3] *Tárikhu'l-Ḥukamá*, p. 189.

[4] *Ṭabaqátu'l-Aṭibbá*, Vol. I, p. 87.

[5] *Murúju'l-Dhahab*, Vol. VII, pp. 173-80. A description of the principles of the empirics and of the methodists is given in this discussion.

[6] *Ṭabaqátu'l-Aṭibbá*, Vol. I, p. 189.

[7] *Ibid.*, p. 198.

[8] See Chap. V, p. 52

A. The Arab physicians in the court of Hárún a'r-Rashíd.

From the "*Fann-i-Jarráhí ki Tárikh*" of Ḥakím Jalálu'd-Dín Ḥusámi.

With the courtesy of Dr Yûsufu'd-Dín of Osmania University, Hyderabad and kind permission of the author.

B. The portrait of Ḥakím 'Ubaydulláh b. Bukhtishu' (d. 450 Circa/1058 A.D. Circa) with Amír Sa'dud'-Dín.

From the B. M., Ms. of *Na'tu'l-Ḥayawán* (Or. 2784) fol. 101 b.

an interest for science in their courtiers and subjects. Isḥáq b. Sulaymán b. 'Alí al-Háshimí,[1] Muḥammad b. 'Abdu'l-Malik al-Zayyát,[2] Ibnu'l-Mudabbir,[3] 'Abdalláh b. Isḥáq [4] the family of Barmecides[5] and of the Banú Músá [6] are among the courtiers and private persons who showed great zeal in attracting students of medicine to Baghdád and in encouraging them to enrich Arabic medical literature with translations and independent contributions.[7]

Baghdád as a great literary centre.

Baghdád, the metropolis of Islam, thus assumed the fallen mantle of Rome and Alexandria. Hither came the most able men of the time from all quarters of the globe, attracted by the

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[1] He got a Sanskrit book on drugs translated into Arabic by Manka (*al-Fihrist*, p. 303). He was interested in Indian Medicine, probably because he had lived in India as governor of Sindh (*al-Ṭabari*, Vol. III, p. 609).

[2] He used to spend about two thousand dinars a month on translators and copyists (*al-Ṭabari*, Vol. I, p. 206). For his interest in literature see *Kitábu'l-Aghání*, Vol. XX, p. 46-47.

[3] *Ibid.*

[4] *Ibid.*

[5] Yaḥyá b. Khálid got the compendium of *Susruta* translated into Arabic (*al-Fihrist*, p. 303).

[6] The Banú Músá who are also known as Banú-Munajjim, were the greatest patrons of Arabic scientific literature after the Caliphs. They sent a commission to Byzantium to acquire Greek works, (*al-Fihrist*, p. 243), brought Thábit b. Qurra to Baghdád and introduced him and many other scholars to the court of the Caliphs (*al-Ṭabari*, Vol. I, p. 215; *Mu'jamu'l-Udabá*, Vol. V, p. 460). They paid Ḥunayn and others 500 dinars a month for translating medical works into Arabic (*al-Ṭabari*, Vol. I, p. 187). They had a big library which was a great attraction for people from different towns (*Mu'jam*, Vol. V, p. 467).

[7] Ṭáhir, the governor of Khurásán, after making his son a *Wáli* of Diyári-Rabi'a, wrote to him a long letter (*Annals* of al-Ṭabarí, series 3, Vol. II, pp. 1046-61), instructing him in the art of governing people. In this letter which was much admired by Ma'mún, and a copy of which was sent by him to all the officials, he says: " you should establish hospitals for the sick and appoint physicians and attendants to treat and attend them " (*al-Ṭabari*, series 3, Vol. II, p. 1059).

pâtrônage of the princes and private individuals, to employ their medical talents in well-stored libraries and well-equipped hospitals, and by their collective effort they produced the vast and varied literature of Arabian medicine. Here trade brought a large variety of new medicament like سناء Senna, فلنجه Fálanja, سلاجيت Salájít, and اكت مكت Akit makit. At least as regards the international aspect of its medical school, Baghdád had excelled the previous seats of learning. Neither at Rome nor at Alexandria were Indian Medical men working side by side with those of other nations, nor were so many important Indian and Greek medical works translated into any other language as into Arabic.

The different groups of medical men.

The different groups of these men of many-sided learning furthered the study of Arabian medicine in different ways. Some translated Greek or Indian medical works into Arabic. Some tested and verified the medical principles established by the ancient physicians. Some tried to systematise the diverse branches of medical science into one harmonious whole. We will deal in this chapter with the translation of medical works into Arabic and with the verification of medical principles by the Arabic medical writers.

The early translators.

Though the translation of medical works into Arabic was resumed in the 'Abbásid period, during the reign of al-Manṣúr, and was organised in the reign of Hárún, yet it was not carried out on any large scale or sound principle until the appearance of Ḥunayn b. Isḥáq[1] in this field, about the end of the reign of al-Ma'mún. Almost all the early translators, like Biṭríq, his son Yaḥyá, and Stephen b. Basil, were non-Arabs, lacking regular education in Arabic language, the mastery of which was just as essential as that of Greek language and of medical science for translating Greek medical works into Arabic. This

[1] For his biography and translations see Cyril Elgood's *Medical History of Persia*, pp. 104-13, 116-20.

deficiency in the early translators must have gravely hampered their work and rendered it useless to the Arabic-reading people.

Remarks of Bahá'-uddín.

This conjecture is corroborated by a passage in the *Kashkúl* of Bahá'uddín-al-'Āmulí. He says that "Yúḥannā the son of Biṭríq and Ibn Ná'ima of Emessa, while translating, considered every single word of the Greek text and replaced it by its Arabic equivalent." "This," he continues, "was not a sound method of translation, firstly, because Arabic equivalents could not be found for every Greek word, on account of which a large number of Greek words were used by them in their translations and, secondly, because the syntax of the two languages very often differs. Again metaphorical expressions, the use of which is quite common in every language, cannot be properly translated by this method."[1]

Ḥunayn as a translator.

About the end of the reign of al-Ma'mún there appeared in the Graeco-Arabic translation department of the Baytu'l-Hikma the great personality of Abu Zayd Ḥunayn b. Isḥáq al-'Abádí. He was fully qualified for translating Greek medical works into Arabic.[2] He knew Arabic as his native tongue and further studied it with the great grammarian Khalíl; he had learnt Greek language at Alexandria, and had received his education in medical science, from Yúḥannā b. Másawayh. Being thus well-equipped, he revolutionised the old system of rigidly literal translation and based it on the better principle of freely expressing the sense of the Greek texts in Arabic, without caring to render exactly every single word. Though he was not too free in his translation and always tried to be as literal as possible provided the sense was clearly expressed, yet, in order to achieve

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[1] *Kashkúl*, Buláq, 1288, A.H., p. 191.

[2] Ḥunayn could not have become a translator in the *Baytu'l-Ḥikma* before 830 because he was born in 809 and it is extremely improbable that he had finished his student life before he was 21 years of age.

this end, he did not hesitate to add certain explanatory phrases where he thought it necessary to do so.[1]

His students.

Some time after he had entered the translation department, Ḥunayn engaged other competent translators to assist him in his work. His son Isḥáq, his nephew Ḥubaysh, 'Isá b. Yaḥyá and al-Raháwi are some of his assistants who are mentioned by Arab bibliographers. All of them being students and assistants of Ḥunayn they must have followed his method and principle in their translation. This is evident at least in the case of Ḥubaysh, whose translation of the 9th—15th books of Galen's *Anatomy* has come down to us, and has been published with a German translation by Dr. Max Simon. In his introduction to the Arabic text describing its character, Dr. Simon says: "He (the Arabic translator) has endeavoured to translate all that is essential in the contents (of the text). Of course he has dealt with the conjunctions more freely, at places very freely indeed. At any rate he has taken the trouble to convey all the components of a sentence, including the Grammatical ones in some form or other. He has followed a principle which even a modern translator may follow within certain limits, if his aim is a translation faithful to the sense which is always more than a purely literal one, and which presupposes familiarity with the nature of the subject. On the whole the Arab has thoroughly succeeded in achieving his purpose."[2]

Their care in translation.

The translator of these books of Galen's *Anatomy* had used, besides a Syriac translation, three copies of the Greek test,[3] no doubt, for the purpose of collation. If it be assumed that it was

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[1] Our opinion is based on the comparison of the quotations of Dioscurides in the Mufradát of Ibnu'l-Bayṭár with the German translation of Dioscurides' book by Berendes. The additional explanatory phrases which are found in the quotation at many places are not found in the German translation.

[2] *Anatomie des Galen*, Vol. I, Int. p. 45. He also says that many explanatory phrases are added in the Arabic text which could not have occurred in the Greek text, Vol. I, Int. p. 14.

[3] *Ibid.*, p. 18.

the rule of the school of Ḥunayn to use as many copies of the Greek texts, as might be available, this would show that they took care to make their translation as correct as possible. It is further shown by the fact that mastery of the subject concerned, by the translator was also considered essential. It was, therefore, that the translation of Mathematical works rendered by Ḥunayn and others who were not specialists in the subject, were revised and checked by Thábit b. Qurra the Mathematician.

An interesting example of the continuous efforts of the Arabic scholars to make their translations as useful as possible is supplied by the history of the translation of the great work of Dioscurides on plants. The book was translated into Arabic at first at Baghdád either by Ḥunayn or Ḥubaysh as Ibnu'l Nadím says[1] or by Stephen the son of Basill, and revised by Ḥunayn as Ibn Abi Uṣaybi'a relates on the authority of Ibn Juljul.[2] But this translation was very defective, for many of the plants mentioned in the book could not be identified by the translator; he just borrowed and utilised their Greek names without making any effort to identify them. When a copy of it was brought to Spain it could not be fully utilized either by the botanists or by the physicians. In 337 A.H./948 A.D. Romanus, the emperor of Constantinople, however, sent to Abdu'l-Raḥmán III (al-Náṣir) of Spain rich presents in which was included an illustrated copy of the book of the great Greek botanist. Abdu'l-Raḥmán wrote back to the Roman emperor requesting him to send to the Amír some one well-versed in Greek language who might instruct the Amír's employees in that language. A monk named Nicholas was sent to Spain in the year 340 A.H./951 A.D. A council of eminent physicians and botanists of Spain was appointed to decipher and identify the plants which could not be identified by Stephen. They sat together with Nicholas and discussed with him the doubtful plants and identified them with

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[1] *al-Fihrist*, Leipzig Edition, p. 293.

[2] *Ṭabaqátu'l-Aṭibba*, Vol. II, pp. 46-47.

the help of the Greek monk. Only a few (12 or so) of them remained unidentified.[1]

Arabic Medical technical terms.

The great difficulty which the translators of the medical and other technical works had to face was in connexion with the technical terms, almost all of which they must have coined. With so little of the early Arabic medical literature available, it is difficult to trace their development, still a glance at the indices of this dissertation will show what system the translators followed in coining the pathological and other medical terms. Sometimes they used only phrases descriptive of the disease of the organs affected, such as وجع الجنب , وجع الرية , ورم الكبد , وجع الركبة , وجع الكلية , ورم الطحال , etc. Sometimes they tried to express the peculiarity of the disease by means of a metaphor like داء الفيل , داء الثعلب , داء الاسد , داء الحيّة , etc. Sometimes they tried to explain the peculiar character of the disease without employing any metaphor as we find in such cases as المرض المزمن , تقطير البول , عسر البول , حمّى اليوم , حمّى الغب , الدوار , الحمّى الدائمة , etc. Sometimes they used such words as were in common use, or their derivatives in a particular technical sense, like الرجاء , *hope*, in the sense of Hydrometra, الآكلة , *the eater*, in the sense of Gangrene, النملة , *the ant*, in the sense of Herpes, الظفره *the nail*, in the sense of Pterygium, الصداع from صدع , *to split*, in the sense of Headache, الشقيقة from شق *to tear*, in the sense of Hemicrania, etc. But were the Arabs original in coining these and other technical terms? We are inclined to answer this question in the negative and say that the Arabs, in most cases, if not as a rule, translated the Greek technical terms, literally, into their own language whether in Anatomy, Pathology or Physio-

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[1] On the standards of the translation of the Greek works into Arabic and their translation at a later period into Latin see the learned and interesting remarks of C. Elgood in his *Medical History of Persia*, pp. 113-15.

logy. The following table of Arabic and Greek nomenclature will illustrate our remark :—

Anatomical terms

اذني القلب	The two appendages of the Heart	καρδίας ους.
اصل الجفن		ῥίζα τοῦ βλεφάρου.
بطون الدماغ	Ventricles of the brain	κοιλίαι τοῦ ἐγκεφάλου.
تجويف الرحم , وعاء الرحم	Cavity of the utirus	κολπος της ὑστέρας.
تجويف القلب	Cavity of the Heart	κοιλίαι τῆς καρδίας.
الرطوبة الجليدية	Crystalline Lens	κρυσταλλοειδὲς ὑγρόν.
الطبقة الشبكية	Retina	ἀμφιβληστροειδὲς χιτών.
الطبقة العنبية	Iris of the eye	ῥαγοειδὲς χιτών.
الطبقة القرنية	Cornia of the eyes	κερατοειδὲς χιτών

A large number of other Anatomical terms like 'عنق الرحم , فم الرحم , المعاء الصائم , المعاء الاعور , قعر المعدة , فم المعدة , and others are nothing but literal translation of Greek terms, as may be seen by referring to the Glossary of the *Anatomie des Galen* of Dr. Simon and Appendix (I) of this book.

Pathological terms

The four stages of fever :—

الابتداء	Beginning	ἀρχή
التزيد or الصعود	Rise	ἀναβασις
الانتهاء	Height (of Rise)	ἀκμή
الهبوط or الانحطاط	Falt	καταβασις
الاستسقاء	Dropsy	ὕδρωψ
الاستسقاء الزقي	Ascites	ἀσκίτης ὕδρωψ
الاستسقاء الطبلي	Tymbanites	τυμπανίτης ὕδρωψ
الاستسقاء اللحمي	Hydrops Anasanca	ὑποσαρκίδιος ὕδρωψ
استطلاق البطن	Relaxation of the Boweis	κοιλίας ῥυσις

الآكلة	Gangrene	γάγγραινα
البلغم الحامض	Acid Mucus	φλέγμα ὀξύ
البلغم الحلو	Sweet Mucus	φλέγμα γλυκύ
البلغم الزجاجي	Hyaline Mucus	φλέγμα ὑαλοῦς
شطر الغب	Semitertian	ἡμιτριταῖος
حمّى الغب (الحمّى المثلثة)	Tertian fever	πυρετὸς τριταῖος
حمّى الربع	quartan fever	πυρετὸς τεταρταῖος
الحمّى (المحرقة)	Causus	καῦσος
داء الاسد (الجذام)	Leontiasis	λεοντίασις
داء الثعلب	Alopecia	ἀλωπεκία
داء الحيّة	Ichthyosis	ὀφίασις
ذات الجنب	Pleurisy	πλευρῖτις
ذات الرية	Pneumonia	πνευμονία
الزرقة	Glaucosis	γλαύκωσις
الشهوة الكلبية	Canine appetite	κυνοειδὴς ὄρεξις

Reference to Appendix (1) will show that many other Arabic terms under this heading, *e.g.*, terms denoting different kinds of urine and different kinds of pulse, are translated literally from the Greek terms.

Physiological terms

القوة الجاذبة	Attractive Power	δύναμις ἑλκτική
الماسكة ,,	Retentive Power	,, καθεκτική
الدافعة ,,	Repulsive Power	,, προωστική
النفسانية ,,	Spiritus Vitalis	,, ψυχική
الحيوانية ,,	Spiritus Animalis	,, ζωτική
الطبيعية ,,	Spiritus Naturalis	,, φυσική

This method of translating literally Greek technical terms has been employed even in Pharmacology. We find that the

Arabic names of many plants are literal translations of their Greek names. Below are given only a few instances; many others of a similar type will be found in Appendix (2).

اذن الفار	Par taria officinalis	μυος ωτις
بست پائه = بسفائج P. كثير الارجل	Polypody	πολυποδιον
ذو ثلاث حبّات (الزعرور)	Polypodium vulgure	τρικοκκος
لسان الثور / لسان الحمل } P. گاؤزبان	Bugloss, ox-tongue	βουγλωσσον / προβατογλωσσον
لحية التيس	Sasyfy	τραγοπωγων[1]

Though the Arabs translated the Greek technical terms, in most cases, yet we will not be justified in concluding from this that they did not develop medical nomenclature any further than the Greeks. Dr. Simon says that the Arabs, in later period, advanced the formal side of the medical science by developing the Anatomical nomenclature further than what

Development of Arabic medical nomenclature.

[1] The same system, it seems, was followed in some other sciences also which the Arabs borrowed from other nations. In Logic the Arabic terms given below with their Greek equivalents appear to be translations of the corresponding Greek terms.

المقدمه	Premiss	προτασις
حد اوسط	Middle term	ορος το μεσον
حد اكبر	Major term	το μειζον ακρον
شكل	Figure	σχημα
الدور	Vicious circle	κυκλος
المقولة	Category	κατηγορια

In Alchemy ذهب فوفير and مزاق القمر are probably translations of χρυσοκορυλλον and ἀφροσέληνον respectively (*Ar. Alchemisten*, Heidelberg, 1924, Pt. I, pp. 21, 23, footnote). But in alchemy the Arabs could not have followed this system too frequently except in regard to the names of substances, because this science was not developed by their predecessors.

they received from the Greeks. In this they must have been helped by the scientific development of Arabic Grammar. Thus in case of single-worded Pathological terms they mostly used the form فُعال, like خناق, Angina, بخار, Fever, كزاز, Tetanus صداع, Headache, دوار, Vertigo زكام, Catarrh, etc. In Pharmacology they mostly used the form فعول, such as سعوط, snuff, سفوف, powder, حمول, suppository, قيوء, emetic, لعوق, linctus لطوخ, plaster, etc.

It is difficult, however, to determine whether this system of translating technical terms was adopted by the early translators and maintained by Ḥunayn and his students, when they entered the translation department, on the ground that these Arabic terms had already gained currency, or whether they themselves liked this system and approved it because they were unable to substitute it by a better system.

The share of Ḥunayn in Graeco-Arabic medical translation.

Ḥunayn and his school, however, almost entirely by their own exertions [1] reproduced in Arabic, in less than fifty years well-nigh all the impportant medical works of the Greeks. To what extent this part of Arabic medical literature was indebted to the school of Ḥunayn, will be made clear by the following table[2] :—

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[1] We have said this because the physicians of Jundishápúr are not mentioned as translators of any medical work into Arabic. Yúḥannáh b. Másawayh himself is not mentioned as a translator. The name of George, who is mentioned by Ibn Abí Uṣaybi'a as a translator (Vol. I, p. 203), does not occur in the list of translators given by Ibnu'l Nadím (*al-Fihrist*, p. 244). Even Ibn Abí Uṣaybi'a does not say which medical works he had translated. Only one Kunnásh of George is mentioned by the Arabic bibliographers; and this book which he had written in Syriac was translated into Arabic by Ḥunayn (*Ṭabaqát*, Vol. I, p. 125).

[2] In this table I have left out those Greek authors the translators of whose works are not mentioned by Ibnu'l Nadím. The table is based on the statement of Ibnu'l-Nadím (pp. 288-93).

Greek authors	The number of works translated	Number of works translated by Ḥunayn's school.
Galen	91	85
Oreibasios	5	3
Paulos	2	1
Dioscorides	1	1

These translations, in spite of the great care with which they were made, were not always free from faults. Ibnu'l-Bayṭár says in connection with the word سطرونيون that "Ḥunayn has translated it as كندش, which is far from being correct."[1] He also says in connection with the word شقراص, that Ḥunayn has translated the Greek word قسوس (probably κισσός) as شقراص. It is strange, he says, that Ḥunayn has done so, because these two plants do not even resemble each other.[2] Dr. Simon has also referred to some mistakes in the Arabic translation of Galen's Anatomy. But, as he says, such mistakes are not many.[3]

Ḥunayn and his students, apart from translating the Greek medical works, made also some independent contributions to the Arabic medical literature. Long lists of their independent medical works are found in the *Fihrist*, and other Arabic bibliographical works.

The Indian physicians in Baghdád.

Side by side with the physicians well versed in the Greek system of Medicine, however, there were living at Baghdád many Indian medical men, having a thorough knowledge of their own system, who sometimes vied with their rivals and showed the efficacy of their art where the devotees of the Greek systems had failed.[4]

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[1] Vol. III, p. 13. Ibnu'l-Bayṭár has also referred to other mistakes of translators in general (though he has not mentioned the name of Ḥunayn), Vol. II, p. 46.

[2] Vol. III, p. 66.

[3] *Anatomie des Galen*, Vol. I, Int. p. 45.

[4] For such cases see *Tabaqátu'l-Aṭibbá'*, Vol. II, pp. 33-35.

CHAPTER IV

Indian Medicine under the 'Abbásids

Relation between ancient Arabia and India.

The Arabs appear to have got much regard for India even before the rise of Islám. This is apparent from the fact that many of them gave their daughters and sweethearts the name Hinda. They were at any rate in touch with India before the rise of Islám as it has been proved on philological and other grounds. The names of several Indian products like Indian sword, Indian spices, sandal, aloes-wood, etc., are found in pre-Islámic Arabian poems. Several words of Indian origin like *Káfúr* (kapúr, camphor), *zanjabil* (zaranjabira, ginger) and *ṭúbá* (topa) occur in the Qur'án also. The traditions current among the Muslims that Adam descended from Paradise to Indian soil and received his first revelation in this country,[1] also show that the Arabs had special regard for it. This contact, however, was due to the commercial relations between Arabia and India before the rise of Islám. For, since the ancient time till about the 16th century of the Christian era the Arabs served as an important medium through which the products of China, Indonesia, India and Persia passed to Egypt and to Western countries.

Closer contact between them under Islám.

The rise of Islám and the establishment of its vast empire extending from the borders of France to those of China gave a spur to the commercial activities of the Arabs and to their love for travels by land as well as by sea. Thus they were brought in closer contact than before, with the various peoples and their cultures. Many of them also settled down in some of the coastal towns of India during the early period of the history of Islám, in connection with their business activities. Some of the Indians also are said to have been seen in the company of

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[1] *'Arab wa Hind ke Ta'alluqát*, published in 1930, pp. 3, 12, 71-72.

the Prophet and some of them are said to have settled down in Mesopotamia during the early part of the Umayyad regime.[1] As a matter of fact, it has been claimed that it were the Arabs who for the first time gave the name Hind (India) to the whole of this sub-continent.

Not long after this, Sindh was conquered by the Umayyads and was annexed to their empire. Many Arabs settled down there, made it their home and developed great love for it, which has been beautifully expressed by one of their poets. He says:

Eulogy of India by an Arab poet.

"When India and its arrows were admired in the battle-field my friends disliked it, but this was not proper;

By my life, it is a land where, when rain falls, it turns into pearls and ruby for those who have no ornaments;

From here come musk, camphor, amber and aloes-wood, and various kinds of perfumes for those who require them;

Here grow all kinds of sweet-smelling substances and nut-meg, and andropogonnadus;

Here are found ivory and *JAI-PHAL*, and aloes-wood, and sandal and here is found in abundance the mineral *Tútia*;

Here are found the lions, the leopards, the elephants and the bears;

And here are found the cranes, and the parrots and the peacocks and the pigeons;

And here grow the coconut tree and the ebony tree and the pepper plant;

And here are made the unparalleled swords which need not be polished, and the lances which when wielded, large armies are routed;

Who can deny the excellence of such a land except a fool?"[2]

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[1] *'Arab wa Hind ke Ta'alluqát*, pp. 11-12.

[2] *Athárul Bilád*, al-Qazvíní, p. 85.

Cause of greater influence of Greek culture on the Arabs.

From among the cultures with which the Arabs came in contact, however, they were impressed most by those of the Greeks and of the Indians. But some of the centres of the Greek culture, *e.g.*, Alexandria, Emessa, Damascus, Ḥarrán, Ḥírá and Jundisháp̣úr were situated nearer to Arabia and to the capitals of the Islámic State in the early period of its history than those of the Indian culture. The Arabs, therefore, first took to the Greek culture, and the translation of the Greek works into Arabic began under the Umayyad regime as it has been already stated. But before long they realized the great value of Indian culture and from the beginning of the 'Abbásid period the translation of the Indian works into Arabic and their assimilation by the Arabs began[1].

High regard of the Arabs for Indian culture.

These translations highly impressed the Arab scholars. Several Arabic writers of the 3rd and the 4th centuries of the Islámic era have emphatically expressed their high regard for Indian culture. 'Amr b. Baḥr al-Jáḥiẓ of Baṣra (d. 869 A.D.), for example, has remarked :—

Its appreciation by al-Jáḥiz.

"I have found the inhabitants of India to have made great advancement in Astrology and in Mathematics. They have a special Indian script. In the Science of Medicine also they are highly advanced. They know some of its special secrets and are experts in the treatment of serious diseases. They are experts in the arts of sculpture, painting, and architecture, etc. Their paintings in colour are found in arches and similar structures. They possess the game of chess which is the noblest game and requires more intellect and intelligence than any other game. They make shining swords and are the best swordsmen having great mastery on the art of wielding them. They know the charms by which the poisons may be counteracted and pains cured. Their music is charming. The name of one of their musical instruments is Kankala which consists of a single string fixed on gourd (*Kadú*). It is used in place of *Sitár* and

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[1] The opinion of Sachau (*India*, Introduction) in this connection is not based on facts.

Jhánjh. They have various kinds of dances. They have special skill in fighting with lances. They know the '*Munáṣafa* '(?). They know magic, fumigation and cauterization. They have a script comprehending the letters of various languages, and many other scripts also. Their literature is rich in poetry and has long orations. They have special instinct for philosophy and literature. We have received the book '*Kalíla-Wa-Dimna* ' from them. They are thoughtful and vigorous. The Chinese do not possess the qualities which they have. They have good judgement and follow praiseworthy practices like cleaning and brushing the teeth, doing physical exercise and dying the hairs and combing and dressing them. They have beauty, grace, elegance and fragrance. Their women are examplary. From them the royalties get the best aloes-wood and with them originated mysticism and charms which counteract the poisons. The origin of Astronomical Science also goes back to the Indians. From them the other peoples learnt it. Adam descended from the heaven to their country. It is said that the Abyssinians are well-built and have fine voice. But you will certainly find these qualities among the young Sindhi songstresses also. There is yet another special quality among them. Among the slaves the best cooks are those from Sindh. They have natural instinct for preparing well all kinds of tasteful dishes. Another excellence of them is that the money-changers do not trust their bags and exchange-houses but with the Sindhis and their sons, because they have better insight in matters of exchange and are more trustworthy and loyal than others. Few of the money-changers would trust a Greek or a Khurásání with his exchange bag and keys."[1]

Its appreciation by al-Ya'qúbí.

Another important author the well-known historian, al-Ya'qúbí (d. 900 A.D.) remarks :—

" The Indians are men of science and thought. They surpass all other peoples in every science; their judgement on astronomical problems is the best; and their book on this subject is the *Siddhánta* which has been utilized by the Greeks as well as the Persians and others. In the Science of Medicine their ideas are highly advanced. Their books on this subject are (*i*) *Susrud* (*Susrúta*) which describes the symptoms of diseases and the method of their treatment and their medicaments, and (*ii*) the *Charak* (*Charaka*) and (*iii*) the *Nidán* (*Nidána*) which deals with the

[1] Rasá'il of al-Jáḥiz, Egypt, 1324 A.H., pp. 81-82. Two independent separate collections of the small treatises of al-Jáḥiz have been published from Egypt. The first of these was published in 1324 A.H.

symptoms of four hundred and four diseases without giving their treatments, and (*iv*) the *Sindhshán* (*Siddhâyoga*) which literally means the purity of success (*Ṣafwun Nujḥ* = purity of success or elixir of success) .....And on Logic and Philosophy they have a large number of books which deal with their principles. From among these books are (1) the book called *Tufa* (*Topa*?) which deals with the definition and scope of Logic and (2) the book dealing with the problems on which the Greeks and the Indians differ (?). And they have a large number of other books which are too many to be mentioned."[1]

Its appreciation by al-Balkhí.

Another great Arabic writer of the 9th century of the Christian era, Abú Ma'shar al-Balkhí, (d. 885 A.D.) remarks :—

"The Indians are the first (most advanced) nation, very large in number and belonging to a noble country. All the ancient peoples have acknowledged their wisdom and accepted their excellence in the various branches of knowledge..... The kings of China used to call the Indian kings as the kings of wisdom because of their great interest in the sciences..... The Indians, therefore, according to all the nations throughout the ages had been the mines of wisdom, and the fountains of justice and administration. But on account of the great distance of India from our country few of their compositions reached us. And, therefore, only a small portion of their sciences was received by us. We learnt of only a few of their scholars. In Astronomy, for example, there are three schools of thought in India—(*i*) the School of *Siddhánta*, (*ii*) the School of *Arjbhar* (*Aryyabhaṭṭa*) and (*iii*) the School of *Arkand* (?) or (Khaṇḍakhâdyaka).[2] But in spite of our efforts we received only the theory of *Siddhánta*. And this is the theory which has been followed by a group of Muslim scholars who based their (Astronomical) tables on it, *e.g.*, Muḥammad b. Ibráhím al-Fazárí, and Ḥabash b. 'Abdallah al-Baghdádí and Muḥammad b. Músa al-Khwárizmí and Ibnu'l-Ádamí and others. And the meaning of the word *Siddhánta* is "the Eternal Times" as Ibnu'l-Ádamí has explained it in his Tables. In music we have received from them the book called *Yâfar* (?). It literally means "the Fruits of Wisdom". It contains the principles of modulation and the collections of tunes. And what reached us of their science of Ethics is the book *Kalila Wa Dimna* which is widely known. And what reached us of their works on

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[1] *al-Yá'qúbí*, Leyden, Vol. I, p. 105.

[2] Sachau—al-Bírúní's *India*, Vol. I, Int. pp. xxxv, xxxi.

arithmetic is the one which has been ellaborated by Abú Ja'far Muḥammad b. Músa al-Khwárizmí. This is the shortest process of calculation easiest to learn. It proves the sharp intelligence of the Indians, their creative genius and their excellence in invention."[1]

These observations of three of the important authoritative Arabic writers abundantly show the high esteem in which the Arabs held the people of India and their culture. Their high estimate of the Indian culture, as the contents of their remarks show, was based on their personal study and experience. One of them has also pointed out the causes on account of which they could not have as thorough a knowledge of the various branches of Indian sciences as they had of those of the Greeks.

Indian pandits at the court of al-Manṣúr.

But in spite of these difficulties the advent of the 'Abbásids and the high influencial position attained in their court by the Barmecides who had been greatly interested in Indian sciences, facilitated the translation of Indian works into Arabic.

Al-Manṣúr, the second 'Abbásid Caliph received embassies from Sindh one of which included some Indian pandits who presented him with two Indian books on Astronomy : the *Brahma Siddhánta* and the *Khaṇḍakhâdyaka*. He ordered Ibráhím al-Fazárí to translate them into Arabic with the help of these pandits.[2]

Influence of the Barmecides in the court of al-Rashíd.

During the reign of al-Rashíd, the Barmecides attained the highest and most influencial position in the 'Abbásid court. They were the descendants of the high priest of the Buddhist temple of Balkh. Their title Barmak is an Arabicized form of the Indian term ' Paramukh ' which was the title of the high priest of the temple. Khálid, the Barmecid, was probably the first of them to accept Islám. His father, the last Barmak, was skilled in

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[1] *Tárikhu'l-Ḥukamá'*, pp. 265-67.

[2] *Tárikhu'l-Ḥukamá'*, p. 270; *India*, Vol. I, Introduction p. xxxi. Ibid. Chapt. I.

Astronomy, Philosophy and Medicine.[1] His descendants, naturally had special interest in Indian sciences and encouraged the translation of Sanskrit medical works into Arabic. In addition to the Barmecides there were other courtiers of Hárún also like Abú 'Umar al-A'jamí, Isḥáq b. Sulaymán al-Háshimí, and Abú Ḥátim al-Balkhí, who were interested in this branch of cultural activity. But the Barmecides were the most influential and resourceful of all of them. They were, however, helped in attainment of their objective by certain incidents in the court.

Their interest in Indian Sciences.

It has been related, for example, that Hárún-al-Rashíd once, suffered from some serious disease which baffled the talents of the practitioners of the Greek system of medicine in Baghdád. At last at the suggestion of one of his courtiers, a physician from India was called by the Caliph who was treated by him and cured of his disease.

Indian physicians at Baghdád.

This was Manka (Manikya). He has been described as being well versed in medical and other sciences of India, a successful practitioner of the healing art and a philosopher of saintly character, having a profound knowledge of the Indian as well as of the Persian (Pahlawí) language. The Caliph gave him rich reward and bestowed upon him large properties.[2] He must have also included him among the nobles of his court. There he acquired a thorough knowledge of Islámic religion and discussed its merits with the Muslim savants and ultimately was converted to Islám.[3] He was attached to the hospital of the Barmecides and translated several books from Sanskrit into Persian or Arabic language[4] which will be mentioned later.

The rival of Manka at the 'Abbásid court.

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[1] *Encyclopaedia of Islám*—Art. Barmak.

[2] *Ṭabaqátu'l-Aṭibbá*, Vol. II, p. 33; *Ṭárikh of al-Ṭabarí*, Leyden, Vol. III, pp. 747-48.

[3] al-Jáḥiz, *Kitábu'l-Ḥayawán*, Vol. VII, p. 65.

[4] *al-Fihrist*, Leipzig, pp. 245, 303.

Another important Indian physician who lived at Baghdád simultaneously with Manka was Ibn Dhan (probably a descendant of Dhanapatí). He was called to Baghdád by Yaḥyá the Barmecid, and was appointed by him as the director of his hospital. At his suggestion Ibn Dhan translated several Indian medical works into Persian or Arabic language[1] which will be mentioned later.

Ibn Dhan at Baghdád.

A third important and successful practitioner of the healing art of India, at Baghdád was Ṣáliḥ,[2] the son or descendant of Bhela (probably Sáli, the son or descendant of the famous physician Bhela). His name is either the Arabicized form of Sáli, or he was converted to Islám and consequently his name was changed as Ṣálih which is more likely. He lived, however, at Baghdád during the Caliphate of Hárún-al-Rashíd (786—814 A.D.), but he does not appear to have held any official position, nor is he credited with the translation of any Indian medical work into Persian or Arabic. He was probably a private practitioner of his art in the metropolis of Islám. His name has been mentioned only in connection with the treatment of a cousin of Hárún-al-Rashíd, of which a graphic description has been given by Ibn Abí Uṣaybí'a, on the ultimate authority of eye witnesses.

The third Indian physician at Baghdád.

Ibráhím a cousin of Hárún-al-Rashíd suffered from epilepsy. The Caliph's personal physician Gabriel examined him and declared that the patient was sure to die within a few hours. The Caliph was greatly touched at the news. He gave up his food and wept and lamented. His courtiers and attendants also felt highly aggrieved at his great sorrow. One of them suggested to him that Ṣáliḥ, the descendant of Bhela who was as great a master of Indian Medicine as Gabriel was of

His treatment of al-Rashíd's cousin.

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[1] *al-Fihrist*, Leipzig, pp. 245, 303.

[2] Cyril Elgood has mentioned the name of this physician as Ṣálaḥ bin Nahala (*Medical History of Persia*, Cambridge 1951, p. 95); but it is based on wrong Arabic Text.

Greek Medicine, might be called. The suggestion was accepted. The physician was called. He went to the residence of the patient, examined him and reported to the Caliph that the patient would never die of the present disease. He said that he would risk all that he possessed, if the patient died of his present sickness. Soon after this, the news of the death of the patient came. Preparations were made for his burial in the presence of the Caliph and his attendants and others including Ṣáliḥ.

Ṣáliḥ strongly protested against all this. He affirmed with complete confidence that he was ready to demonstrate to the Caliph that the patient was alive and he could cure him then and there. He actually demonstrated that Ibráhím was still living by pricking a needle in his left thumb at which he (Ibráhím, the patient) withdrew his hand.

After this at the advice of Ṣāliḥ, Ibráhím was removed out of his coffin, bathed and put in his usual dress. Then Ṣáliḥ blew some snuff prepared of Kundush (verartilum Album) in the nose of the patient. After about ten minutes his body quivered and he sneezed, sat up, and kissed the hands of the Caliph who inquired from him as to what had happened to him. He replied that he had slept such a sound sleep as he had never done before. And he dreamt that a dog had bitten in his left thumb which pained even after he had sat up.[1]

Over and above these three distinguished Indian physicians there must have been at Baghdád several others of them also; but we have received no information about them.

The Arab's knowledge of some ancient Indian physicians and their works.

The Arab scholars, however, knew not only their contemporary Indian savants and physicians who lived at Baghdád, but they had also acquired some information about some of the ancient Indian physicians and masters of sciences. The following of them have been mentioned by the Arabic writers[2] :—

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[1] *Ṭabaqátu'l-Aṭibbá*,' Vol. II, pp. 34-35.

[2] *al-Fihrist*, pp. 270-271, *Táríkhu'l-Ḥukamá'*, p. 265. *Ṭabaqátul-Aṭibbá*,' Vol. II, pp. 32-33.

(1) Kanka (Kankayana) was one of the most accomplished Indian philosophers of the ancient time. He had insight in the healing art and in the properties of the drugs and of the nature of their compounds. He was one of the most learned men with regard to the form of the Universe, the constitution of the firmaments and the movements of the stars. Abú Ma'shar says in the *Kitábu'l-'Ulúf* that Kanka (Kankayana) was unanimously accepted by all the Indian scholars to be the greatest master of Astronomy in the ancient times. Some of the books composed by him are:—(*a*) *Kitábuń-Namúdár fil-Ámár*, (The Book of Horoscopes of Lives?), (*b*) *Kitábu-Asrári'l-Mawálid* (The Book of the Secrets of the Births or of Alchemy?), (*c*) *Kitábu'l-Qiránát* (The Book of the Conjunctions), (*d*) A book on the Science of Medicine. It is of the type of a text book, (*e*) *Kitábun-Fit-Tawahhum* (The Book of Mania or Hysteria), (*f*) *Kitábun fil-Aḥdáthi-'Álami fil-Qirán* (The Book on the incidents that may happen in the world under certain conjunctions of stars).

(2) Sanjhal (Sandelia?) was one of the learned men of India, well versed in the Science of Medicine and Astronomy; and one of his compositions is the *Kitábu'l-Mawálid* (The Book of the Nativities).

(3) Shánáq (Chánakya or Saunaka?). He was one of the medical men of India. He had large experience in the practice of the Science of Medicine and had versatile knowledge of various branches of Science and Philosophy. He excelled in the science of Astronomy, was a good conversationist and occupied a high position in the courts of the Indian kings of his time. He says in his book which he called the *Muntaḥalul-Jauhar* (The Essence of the Reality)—" O Governor (King)! Take care of the slips of the times, and be afraid of their grip and of the pangs of their domination; beware, that all the actions have their consequences, be, therefore, careful of the retribution of the times, for they are treacherous; be, therefore, on your guard against them; the fates are unknown, so be prepared for them; the times are changing, be afraid of their domination. They are full of evils, so fear their severity; they are quick in their deceit, so do not feel secure against their changes. And know that he who did not nurse himself for the diseases of the times during his own life, his cure would be extremely difficult in the home of diseases (after death). And he who humbled down his own (lower) senses and controlled them in doing good for himself, showed his excellence and proved his nobility. And he who did not control his own self which is only one, and failed to control his senses which are five, and he who did not control his senses inspite of their being few and humble, would be unable to control his subordinates and agents, large in number and intractable. Consequently

the common subject people living in the distant towns and far off parts of the dominion would be highly uncontrolable for him."

From among the books composed by Shánáq (Chánakya?) are the (*a*) book of poisons which is in five discourses; (*b*) the book of Veterinary Science; (*c*) a book on Astronomy; (*d*) the *Muntaḫalu'l-Jauhar* (the Book on the Essence of the Reality). This book he had composed for one of the kings of his time, who was called as the descendant of Cumanus (Kumanusa?), the Indian.

(4) Jaudhar (Yasodhara?). He was one of the excellent philosophers and learned men of India, distinguished in his own time. He had an insight in the Science of Medicine and had compiled several books on scientific subjects. One of these books is the *Kitabu'l-Mawálid* (the Book of Nativities or Alchemy?).

In addition to the above ancient Indian scholars and authors the names of ten others of them have been mentioned by Ibnu'l-Nadím, (*al-Fihrist*, p. 271), and by Ibn Abí Uṣaibí'a, (*Ṭabaqátu'l-Aṭibbá*,' Vol. II. p. 32), but in the present state of our knowledge it is impossible to be sure about their identity.

Indian medical works translated into Arabic.

The following Indian medical works, however, were rendered into Arabic during the 'Abbásid Caliphate :—

(*i*) *Charaka*. It was translated into Persian (Pahlawí) probably by Manka (Manikya) and then it was, rendered into Arabic by one 'Abdullah b. 'Alí.

(*ii*) *Susrud* (*Susrúta*). It was rendered into Arabic by Manka (Manikya) at the suggestion of Yaḥya, the son of Khálid—the Barmecid. It consisted of ten discourses.

(*iii*) *Astankar* (*Ashtaṅgahridaya*). It was rendered into Arabic by Ibn Dhan.

(*iv*) *Nidán* (*Nidána*). The name of the Arabic translator of this book is not known. But it has been described as containing the symptoms and description of 404 diseases without giving the methods of their treatment.[1]

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[1] *al-Fihrist*, Leipzig, pp. 303; *Ṭabaqátu'l-Aṭibbá*,' Vol. II, p. 32.—The names of these four books given by Arabic writers have baffled the attempts of several European Orientalists to identify them. But the

(*v*) *Sindhastáq* or *Sindhshán* (*Siddhâyoga*). The meaning of the term has been described by Ibnu'l-Nadím as Ṣafwatun-Nujḥ[1] which means the Purity of Success which is the Arabic rendering of *Siddhâyoga* which means Elixir of Success. It was translated into Arabic by Ibn Dhann.

(*vi*) *Kitábu's-Sumúm* (the Book of Poisons). It is in five discourses. It was translated from the Indian language into Persian (Pahlawí) language by Manka (Manikya) at the suggestion of Khálid the Barmecid and was copied in Persian (Pahlawí) by Abu Ḥátim of Balkh. It was translated at a later period into Arabic by 'Abbás b. Sa'id who read it out to the Caliph al-Ma'mún.

(*vii*) .....The book of Rusa, the Indian woman, dealing with the treatment of women.

(*viii*) .....The book dealing with the opinions of the Indians about the various kinds of snakes and their poisons.

(*ix*) .....A short treatise on drugs.

(*x*) .....The Book of the Treatment of Pregnant Women.

(*xi*) .....The Book of Intoxication (Intoxicants).

(*xii*) .....The book dealing with one hundred diseases and one hundred medicaments, by Tugashtal (?).

(*xiii*) .....The Book on the Effect of Mania or Hysteria.

(*xiv*) .....The book giving names of drugs in ten different languages.

(*xv*) .....The book dealing with the drugs about the properties and nature of which the Indians and the Greeks differ [2]

The Arabic medical writers were influenced more by the Greek works than by the Indian.

The above account of the translation of Greek and Indian medical works into Arabic before the middle of the 9th century shows that by this time the Arabic writers had at their disposal, not only most of the Greek medical works but also

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problem has been set at rest by the identification of several passages from these books quoted in the *Paradise of Wisdom* (*Paradise of Wisdom*. Appendix).

[1] The word has been wrongly given in the *Ṭabaqâtu'l-Aṭibbâ'* as Suratu'l-Nujḥ (Vol. II, p. 32).

[2] *al-Fihrist*, pp. 245, 303; *Ṭabaqâtu'l-Aṭibbâ'*, Vol. II, pp. 32-33.

most of the important Indian medical works. But the study of the independent works of the Arabic writers on medical sciences shows that whereas they were very largely influenced by the Greek system, the influence of the Indian writers on them was confined to the therapeutics and medicaments only. The Greek medical theories were adopted by them almost in their entirety and the names of Hippocrates, of Galen and of Dioscorides had been their bywords. But the medical theories of the Indians did not appeal to them. The names of *Charaka* and *Susrúta* are very sparingly mentioned by them. And the *Ashtaṅghradaya* and the *Niḍâna* are referred to so far as I know by only two of them—(*i*) 'Alí Ibn Rabban-at-Ṭabarí and (*ii*) his pupil Abú Bakr Zakariyya ar-Rází.

Rabban gave a summary of the Indian medical system.

Abu Sahl 'Alí bin Rabban-aṭ-Ṭabarí of whom a detailed account will be given later, gave at the end of his book the *Firdausu'l Ḥikmat (Paradise of Wisdom*, completed in 850 A.D.) a short account of the whole system of Indian Medicine on the basis of four important Indian medical works; (1) the *Charaka*, (2) the *Susrúta*, (3) the *Nidâna*, and (4) the *Ashtaṅghradaya*[1] and referred to the book of an Indian woman medical writer from which he has given the prescriptions for some of the uterine afflictions.[2]

Ar-Rází quoted about a dozen Indian medical works.

After 'Alí b. Rabban, his distinguished and well-reputed pupil, ar-Rází who is considered to be the greatest Muslim physician and chemist, quoted

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[1] *Firdausu'l Ḥikmat*, pp. 557-600. The assertion of Cecilia C. Medler that in the *Firdausu'l-Ḥikmat* the Byzantine and Hindu materials are combined (*The History of Medicine*, 1947, p. 355) is vague and not quite well founded. The whole of the *Firdaus* is based on Greek works. Only at the end of the book the author has given a short account of the Hindu system of Medicine in order to add to the knowledge of the readers of the book (p. 557). At another place he says (p. 588) that whatever he wrote in this section he described as a narrator and not as a follower.

[2] *Ibid.*, pp. 591-94.

the above mentioned Indian medical works together with several others, in many of his books particularly in his Magnum Opus, *āl-Ḥâwi* the *Continens* which was published after the death of the author. It is a gigantic book in many big volumes.[1] "It contains", says Neuburger, "an astounding mass of extracts (mostly literal) from Graeco-Arabic and Indian literature..... .....It is only an immense collection of excerpts and original notes which might have served as the groundwork for a methodically carried out encyclopaedia of Medicine." Ibn Abí Uṣaybí'a says that he found in *al-Ḥâwi* and other works[2] of al-Rází quotations from the following books of the Indians (1) *the Charaka*, (2) the *Susrúta*, (3) the *Nidána*, (4) the *Ashtanghridaya*, (5) the (*Sindhstâq*) *Sidhdhâyoga*, (6) the book of the drugs about the nature and properties of which the Greeks and the Indians differed, (7) the book on the treatment of pregnant woman, (8) the booklet on the Indian drugs, (9) the book dealing with one hundred diseases and one hundred medicaments by Tugashtal (?), (10) the book on the treatment of women by Rusa the Indian woman, (11) the book dealing with intoxication by an Indian, (12) the book dealing with the opinion of the Indians about the various kinds of snakes and their poisons, (13) the book on the effect of mania on various diseases.

Later Arabic writers ignored them.

After 'Alí and al-Rází,[3] the Arabic medical writers seldom if ever, made any reference to Indian medical works excepting *Charak* and *Susrúta* to which some of them referred in connection with the drugs and medicaments. But the Persian books produced in India appear to have been largely influenced by Indian system of Medicine. One of these works will be treated in a later chapter.

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[1] See Brown's *Lectures on Arabian Medicine*, pp. 48-53. The book is now being printed by the Dáiratul-Ma'árif of Hyderabad, Deccan.

[2] *History of Medicine*, Vol. I. pp. 361-62.

[3] *Ṭabaqátu'l-Aṭibbá'*, Vol. II, p. 32. I am unable to give reference to the original works of al-Rází, for they are not available for me at present.

Another Group of physicians.

When Ḥunayn and others, however, were busily engaged in translating Greek and Indian medical works into Arabic there was another equally or more important group of physicians at Baghdád. Thinking the translation work beneath their scholarship and dignity, or feeling themselves unqualified for this work, these men helped in the development of Arabian Medicine by producing independent works in Arabic. To this group belonged almost all the physicians of the school of Jundisháپúr who wrote medical works in Arabic, and also other medical men of this period like Sábúr b. Sahl, 'Isá b. Másа and others.

Their works.

The works of the members of this group so far as it appears from their titles and descriptions given in the Arabic bibliographies, may be divided into two classes.

(1) Those works which dealt with the same subjects with which the ancient physicians had dealt in such of their works as were translated into Arabic, like *Kitábu'l-Ḥummayát*[1] of Ibn Másawayh, the '*Kitábu man la yahduruhu Ṭabibún*'[2] of 'Isá b. Másа, etc. In these works they tried to treat the old subjects on new lines and to add the results of their own experience to what they had received from the ancient. Thus in the *Kitábu'l-Ḥummayát*, Ibn Máswayh treated the subject in a tabular form (مشجر), a form that, so far as we know, had never before been applied to such subjects.[3]

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[1] *Ṭabaqátu'l-Aṭibbá'*, Vol. I, p. 183. The same work of Galen also was translated into Arabic (*al-Fihrist*, pp. 289-90).

[2] *Ibid.*, p. 184. A book of the same title by Rhuphos was translated into Arabic (*al-Fihrist*, p. 291).

[3] In another book, *Kitábu'l-Tashríḥ* (Táríkhu'l-Ḥukamá, p. 38). Yúḥanná b. Másawayh attempted to test and verify the anatomical system of Galen. According to Ibn Abí Uṣaybi'a, he had the ambition to write a book on Anatomy, had kept monkeys to dissect them when they were grown up, had received particular species of them from Mu'taṣim and wrote a book on Anatomy which was admired by friends and foes alike (*Ṭabaqát*, Vol. I, p. 178). According to a story reported by Ibnu'l-

(2) To the second class belong such works of these physicians as dealt with subjects not treated by the ancient writers. The pharmacopoeia of Sábúr b. Sahl, the book on piles by Abú Músá 'Isa, the book on the causes of sudden death by Qusṭá Ibn Luqá, etc. may be included in this class.

Though a very large number of very able medical men were busy in serving the cause of Arabian Medicine in different ways, yet there was an important work in connection with it—the systematization of the different branches of this science—which did not receive any serious attention from these physicians. An able and energetic young man of Ṭabaristán, well-qualified in the healing art, and well-equipped for this work, felt its necessity and took it up. This was Abu Sahl 'Alí b. Rabban, al-Ṭabarí the author of *Firdausu'l-Ḥikmat*.

Qifṭí, he wanted to dissect his own son in order to establish human Anatomy but the Caliph stood in the way (pp. 390-91). But Ibnu'l-Nadím has not mentioned the *Kitábu'l-Tashríḥ* in the list of Ibn Másawayh's works, nor could we find any reference to this book in any extant medical work that we have read. The stories related by Ibn Abi Uṣaybi'a and Ibnu'l-Qifṭí are not found in any Arabian histories.

CHAPTER V

Observations on the life of Abu'l Ḥasan 'Alí b. Sahl Rabban al-Ṭabari the compiler of the first independent Arabic medical compendium.

Mistakes of the Muslim writers about the name and religion of 'Alí b. Rabban.

In spite of his importance as an accomplished scholar in Philosophy, Astronomy and Medicine, in some religions (particularly Christianity and Islám) and some languages, and as an author of several books, some of which are pioneer works on their subjects, he has been generally neglected by the Arabic historians and bibliographers. Some of them, while mentioning his name in connection with other personages, have not written any notice on him at all; some call him once 'Alí b. Zay[1] and again refer to him as 'Alí b. Rayyan;[2] some mention his name as 'Alí b. Zayd;[3] and some allude to him both as 'Alí b. Razín and as 'Alí b. Zayn[4] which is the name given to 'Alí by most of the Muslim writers.[5] Those who have mentioned the name of 'Alí more correctly again differ among themselves in details. Al-Ṭabarí, the historian, calls him 'Alí b. Rabban al-Naṣráni;[6] Ibnu'l Qifṭí calls him Abu'l Ḥasan 'Alí b. Rabban al-Tabarí;[7] and Ibn Abí Uṣaybi'a mentions his name as Abu'l Ḥasan 'Alí b. Sahl Rabban al-Ṭabarí.[8]

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[1] Yaqut *Irshádu'l-'arib*, ed. Margoliouth Gibb Memorial Series VI, vol. II, p. 279; vol. VI, p. 429. *Ibn Khallikán* ed. Wüstenfeld, No. 717, p. 75.

[2] *al-Fihrist*, ed. Flügel Leipzig, 1872, pp. 295 and 316.

[3] *al*-Mas'údí, *Murúju'l-Dhahab*. Ed. Meyard, vol. VIII, p. 326.

[4] Yáqút, *Mu'jamu'l-Buldán*, ed. Wüstenfeld, vol. II, p. 608; vol. III, p. 507.

[5] *al-Birúni*, *Kitábu'l-Hind*, Ed. Sachau, p. 192; Eng. Trans., vol. I, p. 382.

[6] *Annals* of al-Ṭabarí, ed. de Goeje, ser. 1, p. 1276.

[7] Táríkhu'l-Ḥukamá, ed. J. Lippert Leipzig, 1903, p. 231.

[8] *Ṭabaqátu'l-Aṭibbá* Cairo, vol. I, p. 309.

Thus we find that the very name of 'Alí has been corrupted in many different ways, and that his full and correct name has not been given by any Muslim historian or bibliographer. It is only by comparing them with one another and with what 'Alí himself has said in his introduction to the *Firdausu'l-Ḥikmat* that we can make out the correct form of his name as Abu'l Ḥasan 'Alí b. Sahl Rabban aṭ-Ṭabarí.

Ibnu'l Qifṭí, who so far as we know, is the first Muslim bibliographer to write a note on 'Alí, has, however, introduced another fable with regard to his religion, that the father of 'Alí was called *Rabban* because he was a Jew (لانّه كان ربين اليهود).[1] This has been repeated by Ibn Abí 'Uṣaybí'a,[2] in spite of the historian aṭ-Ṭabarí's calling him 'Alí b. Rabban-al-Naṣrání.

Their influence on European writers.

These confused and sometimes contradictory statements of the Muslim authorities with regard to the name and religion of 'Alí caused a corresponding confusion in the European literature. Some Orientalists, thinking that 'Alí b. Sahl and 'Alí b. Zayn were two different persons, have mentioned them separately calling him once the teacher and again a pupil of ar-Rází, and have tried to explain the words " Zayn aṭ-Ṭabarí " as meaning " the Ornament of Ṭabaristán ".[3] Some of them believed that his name was 'Alí b. Dhabl or Zabl with L,[4] while most of them thought that his name was 'Alí b. Zayn.[5] The ambiguous title of the father of our 'Alí and the erroneous statement of Ibnu'l Qifṭí and Ibn Abí 'Uṣaybí'a about his religion also misled the European Orientalists, and consequently his name occurs in connection

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[1] *Ṭárikhu'l-Ḥukamá'* ed.: J. Lippert Leipzig, 1903, p. 231.

[2] *Ṭabaqátu'l-Aṭibbá'*, Cairo, vol. I, p. 309.

[3] Hammer Purgstall, *Cultur Geschichte der Orient*, Wien, 1852, vol. III, p. 391; vol. IV, p. 309.

[4] See Flügel's Article on Ibnu'l-Nadím in Z.D.M.G., vol. XIII, p. 559.

[5] Wüstenfeld *Geschichte der Arabische 'Ärtze*, Göttingen, 1840.

with the Jewish physicians,[1] the Jewish Arabic literature,[2] and Jewish literature in general.[3] When this theory was shown to be false, by the publication of the *Kitábu'd-Díni-wa'd-Daulat* of 'Alí, wherein he explicitly said that before accepting Islám he was a Christian,[4] a great Orientalist concluded from the title of the father of 'Alí (ربن) that probably he was an important member of the Christian Church.[5] But 'Alí in his introduction to the *Firdausu'l-Ḥikmat* says that his father was called "Rabban" on account of his learning and other accomplishments.[6]

Thus in spite of the great interest in 'Alí b. Rabban shown by some Orientalists, a connected account of his life and criticism of his merits and works could not have been written, hitherto, because neither his works were published nor were the biographical details, which are to some extent supplied by 'Alí himself in some of his works, available. We shall, therefore, here, attempt to give a sketch of his life so far as it can be gathered from his works and other sources, together with an estimate of his real merits and criticism of such of his works as have been published or are known to exist in manuscripts.

The place and date of the birth of 'Alí.

Abu'l Hasan 'Alí b. Sahl Rabban-aṭ-Ṭabarí was probably born in a learned family at Merv, about 810 A.D. This can safely be fixed as the period of his birth on the basis of certain incidents which he has

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[1] See E. Carmoly's article on La Medicine Juif. *Review Oriental*, 1841, pp. 310-31.

[2] *Arabische Literatur der Juden*, Frankfort, 1902, p. 32, *et seq.*

[3] Steinschneider's *Literatur der Juden*. English Translation. London 1857, p. 194.

[4] *Book of Religion and Empire*. Tr. Mingana, Manchester, 1922, p. 50.

[5] See Prof. Nöldeke on 'Alí Ṭabarí in *Deutsche Literatur-Zeitung* 1, Jan. 1924, col. 22.

[6] *Firdausu'l-Ḥikmat*, ed. Siddiqi, Berlin, 1928, p. 1. The use of the word "Rabban" in this sense does not seem to be uncommon. Ḥunayan b. Isḥáq was also addressed by Gabriel as (يا ربّى) meaning thereby "my teacher" and "worshipful." *Ṭabaqátu'l-Aṭibbá*, vol. I, p. 186; see also Z.D.M.G., vol. 85 (1931), p. 44.

described in the *Firdausu'l-Ḥikmat* and from the observation of certain natural phenomena which took place before those incidents.

He says that once while offering the night prayers with his father, he saw a flame, in the shape of a thick and long column, rising from the south and passing towards the north, and he remarks that it was not long after this that the king of the mountains of Ṭabaristán was forcibly removed from his kingdom, to which he returned after passing some anxious days.[1] He has also referred to the appearance of comets and shooting stars, etc., (*a*) at Merv before the assassination of Faḍl, the Wazir, by al-Ma'mún, and his taking charge of the Caliphate in Baghdad (818 A.D.), (*b*) at Tabaristán, before the capture and assassination of Mázyár b. Qárin, by the Caliph al-Mu'taṣim (in 838 A.D.), (*c*) before the earthquake and destruction of Fárghana, and the great rebellion against the Caliph (al-Mu'taṣim) which he successfully quelled, but soon died and was succeeded by Harún (al-Wáthiq in 842 A.D.) and (*d*) at Surramanrá-a, before the death of Hárún (al-Wáthiq) due to a serious disease in 847 A.D.[2] The first of these incidents refers to the defeat of Mázyár b. Qárin at the hands of Shahriyár b. Sharwín about the year 825 A.D., his flight to 'Iráq and his re-instatement in his kingdom with the help of al-Mámún.[3] At this time 'Alí must have been grown up enough to offer prayers with his father and to understand these things and therefore we can fix the year 810 A.D. as the approximate date of his birth.

'Alí's family.

'Alí came of a learned family. His uncle Abú Zakkár Yaḥyá b. Nu'mán, well-known in 'Iráq and Khurásán, was renowned for his ability in discussion and excellence in knowledge.[4] His father, Sahl, who

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[1] *Firdausu'l Ḥikmat*, p. 518.

[2] *Ibid.*, pp. 518-19.

[3] Professor Browne's translation of Ibn Isfandiyár's *History of Ṭabaristán*, E. J. Gibb Memorial series II, pp. 146-48.

[4] *Kitábu'd-Díni-wa'd-Daulat*. Cairo 1923, p. 124. Eng. Tr. p. 147.

belonged to a family of secretaries at Merv, was a respectable and literary man, zealous in the pursuit of virtue, had studied Philosophy and Medicine and preferred the medical profession to that of his forefathers, not for the sake of worldly profit, but in order " to conform himself to the divine attributes ", wherefore he was commonly called " Rabban."[1] He also knew the different branches of Mathematics and translated many books from one language into another. According to Ibnu'l-Qifṭí, his translation of al-Majasṭí was more complete than those by other translators.[2]

'Alí was brought up under the care of his father and received his education in medical science from him. He must have studied the different branches of Philosophy and Mathematics, reiglious books, the Arabic, Syriac and Hebrew languages, and perhaps some Greek also, with his father, who knew all these subjects. In his *Firdausu'l-Ḥikmat*[3] we find him discussing philosophical and mathematical problems and explaining Greek terms, while he quotes from Syriac and Hebrew text in his *Kitábu'd-Dini-wa'd- Daulat*[4] and says in the *Firdausu'l-Ḥikmat* that he had translated it into Syriac also.[5]

His interest in Medical Science.

The interest of 'Alí in Medical Science developed under the influence of the times and particularly that of his father. Having finished his studies, he left Ṭabaristán for Mesopotamia which being the seat of the Islámic Government attracted the best intellects of the time from all quarters. He probably settled down at Baghdad, followed the medical profession and became a renowned physician. During this period of his life, he studied most of the important

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[1] *Firdausu'l-Ḥikmat*, Berlin 1928, p. 1.

[2] *Tárikhu'l-Ḥukamá*, Leipzig 1903, p. 187. C. A. Nallino does not believe in the statement of Ibnu'l Qifṭí that Sahl had translated al-Majasṭí. (al-Battani, Part I, p. 310, No. 3).

[3] See the contents of *Firdausu'l-Ḥikmat*, pp. 60, 80; and the *Kitábu'd-Dini-wa'd-Daulat*, text pp. 1-2.

[4] See text pp. 81, 84; Eng. Tr. pp. 95, 98.

[5] *Firdausu'l-Ḥikmat*, p. 8.

medical works of the Greeks, the Syrians and the Indians, and probably such works of the Babylonians as came within his reach.[1] While studying these works he felt the want of a short, self-contained medical compendium which might serve as a guide to students of this science. None of his predecessors or contemporaries who were engaged in translating the works of the ancients into Arabic or testing and verifying the results arrived at by them, had done this work of systematizing the different branches of Medicine satisfactorily.[2] 'Alí took the first step towards it, among the Arabian medical writers, and began the composition of his life-long work the *Firdausu'l-Ḥikmat* (the *Paradise of Wisdom*).

His Secretaryship.

About the end of the reign of al-Ma'mún (833 A.D.) there came a turning-point in the life of 'Alí. Al-Ma'mún bestowed the title of Maulá Amíru'l-Mu'minín upon Mázyár b. Qárin, the prince of Ṭabaristán, and subsequently put him in charge of the highland of Ṭabaristán.[3] 'Alí leaving the medical profession which he liked and loved, entered the service of Mázyár as his secretary, and continued in that position till Mázyár was put to death owing to his rebellion against the Caliph.[4] Mázyár had a great regard for 'Alí, who possessed some influence over the people of Ṭabaristán as is indicated by Mázyár's asking him, among others, to go to certain people whom Mázyár had imprisoned and induce them to pay the arrears of their taxes.[5]

When Mázyár, however, lost all hopes regarding the success of his revolt, he asked 'Alí and others to go to the commander of the Caliph's army and plead for their lives.[6] Granted amnesty,

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[1] *Firdausu'l-Ḥikmat*, p. 1; (*Kitábu Ḥifẓi'ṣ-Ṣiḥḥat*) Bodleian, Marsh, 418. f. 10 b, et, seq.

[2] See *supra* p. 37.

[3] *Tárikhi Ṭabaristán*, pp. 147-48.

[4] *Firdausu'l-Ḥikmat*, p. 2.

[5] *Annals* of aṭ-Ṭabarí, Seri. 3, vol. II, p. 1286.

[6] *Ibid.*, p. 1284.

'Alí went to Ray, where he resumed his practice as a physician. After some time he entered the service of the Caliph al-Mu'taṣim as his secretary,[1] a position which he held till the accession of al-Mutawakkil, who persuaded him to embrace Islám [2] and conferred upon him the title of Maulá Amíru'l-Mu'minín [3] at the same time making him one of his courtiers in recognition of his scholarship and merit.[4] Whilst acting as secretary to Mázyár and to the Caliph al-Mu'taṣim, and during the anxious days which he passed after the defeat and execution of Mázyár, 'Alí's interest in Medical Science remained as keen as ever, and he continued the task of completing his compendium on Medicine.[5]

The date of his death.

The date of his death is not known. But it may be assumed that he died at about the age of eighty-five long after 855 A.D. when he is said to have completed his book *Kitábu'd-Dini-Wa'd-Daulat*[6] and it is not unlikely that about the end of his life Abu Bakr Muhammad b. Zakariyyá ar-Rází studied medicine with him.

Ibnu'l-Nadím has mentioned the names of five of his works :—

(1) *Tuḥfatu'l-Mulúk* (The Present for Kings).

(2) *Firdausu'l-Ḥikmat* (The Paradise of Wisdom).

(3) *Kunnáshu'l-Ḥaḍrat* (The Excellent Compendium).

(4) *Kitábu Manáfi 'il-Adwiyati wa'l-Aṭ'imati wa'l-'Aqáqir* (The Book of the Utility of Foods, Drinks and Drugs).[7]

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[1] *Tárikhu'l-Ḥukamá*, p. 231.

[2] *Kitábu'd-Dini wa'd Daulat*, p. 144. Professor Nöldeke probably relying upon *al-Fihrist*, p. 296, holds that 'Alí accepted Islám under Mu'taṣim. *Deutsche Literaturzeitung* 1. Jan. 1924, Col. 23.

[3] *Kitábu'd-Dini wa'd Daulat*, pp. 5, 144.

[4] *al-Fihrist*, p. 296.

[5] *Firdausu'l-Ḥikmat*, p. 2.

[6] Eng Tr. Int. p. XVI.

[7] *al-Fihrist*, Leipzig, 1872, p. 296.

(5) *Kitábun fi'l-Amthálí wa'l-Ádáb 'Alá Madhábibi'l-Furs wa'r-Rúmi wa'l-'Arab.*[1] (A Book on Proverbs and Etiquettes according to the Persians, the Greeks and the Arabs).

Ibn Abí 'Uṣaybí'a has added to this list the names of five other works by 'Alí :—

(6) *Kitábu Irfáqi'l-Ḥayát.*

(7) *Kitábu Ḥifẓi'ṣ Ṣiḥḥat* (The Book of the Preservation of Health).

(8) *Kitábun fi'l-Ḥijámat* (A Book on Cupping).

(9) *Kitábun fi'l-Ruqa* (A Book on Charms).

(10) *Kitábun fi Tartibi'l-Aghdhiyá*[2] (A Book on Dietetics).

Ibn Isfandiyár has added to this list the name of one more book :—

(11) *Baḥru'l-Fawá'id.*[3]

To this list we must add the name of three other works of 'Alí which are not mentioned by any historian or bibliographer :—

(12) *Kitábu'd-Dini Wa'd-Daulat* (The Book of Religion and Empire).

(13) *Kitábun fi'r-Raddi 'ala aṣnáfi 'l-Naṣárá* (A Book in reply to the

(14) *Kitábu'l-Idáh*, to which 'Alí himself refers in his *Firdausu'l-Ḥikmát* (p. 113).

Different Denominations of the Christians).[4]

Just as there has been confusion in the Arabic authorities concerning the name of 'Alí, so we find in them some misunderstanding about his works also. Some of these books, like the last three ones, have not been noticed by any of them, while others are mentioned under different titles, as if they were different books. Thus the *Baḥru'l-Fawá'id*, mentioned by Ibn Isfandiyár, is only an alternative for *Baḥru'l Manáfi'*, which is the title given by 'Alí to the *Firdausu'l-Ḥikmat*. Probably the *Kunnáshu'l-Ḥaḍrat*,

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[1] *al-Fihrist*, Leipzig, 1872, p. 316. The author of *al-Fihrist* has attributed this book to one 'Alí b. Rayyan al-Naṣráni,; but it is only a corrupt form of 'Alí b. Rabban al-Naṣráni, the name by which aṭ-Ṭabarí the historian refers to 'Alí, in his history (series 1, p. 1276).

[2] *Ṭabaqátu'l-Aṭṭibbá*, Cairo 1882, vol. I, p. 309.

[3] *Tárikhi Ṭabaristán*, E. J. W. Gibb, series 11, p. 80.

[4] *Kitábu'd-Dini wa'd-Daulat*, pp. 86; 93. Eng. Tr. pp. 100, 107.

mentioned by Ibnu'l-Nadím, is also identical with the *Firdausu'l-Ḥikmat*, because 'Alí calls it *Kunnásh* as well.

Time, however, has not been generous with the works of 'Alí. Most of his works disappeared and only three out of a dozen have come down to us. The most important of these, the *Firdausu'l-Ḥikmat*, a full account and criticism of which will be given in the next chapter, has been edited by the present writer and published by the Sonne Press, in Berlin. The *Kitábu Ḥifẓi's-Ṣiḥḥat* which is an abstract of the *Firdaus*[2] is preserved in the Bodleian Library.[1] The *Kitábu'd-Dini wa'd-Daulat*, of which a unique 13th century manuscript is preserved in the John Rylands Library at Manchester, has been edited and translated into English by Dr. A. Mingana.[2]

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[1] Uri's *Catalogue*, vol. I, No. D. L. XXVIII.

[2] The text was published by al-Muqtaṭaf press, Cairo in 1928, the translation was published by the Manchester University press in 1922. A review of this book by Professor Theodor Nöldeke appeared in *Deutsche Literaturzeitung*, for Jan. 1, 1924, Cols. 22-28.

CHAPTER VI

The Firdausu'l-Ḥikmat, the first independent Arabic medical compendium

Importance of the Firdausu'l-Ḥikmat.

The *Firdausu'l-Ḥikmat*, or *Pardise of Wisdom* by 'Alí b. Rabban is the first independent, complete Arabic medical compendium. It gives us a bird's-eye view of the development of Arabic medical literature at the time of its composition. Being based on materials taken from many of the important previous and contemporary writers on the subject, it brings forth prominently the important features of Arabic Medicine, and systematizes its different parts on the basis of Aristotelian principles. It, thus, develops that systematic treatment of the different branches of the Science of Medicine which was begun by Oribasios and Paulos and having passed later on, through the hands of ar-Rází and 'Alí b. 'Abbás and others, culminated in the *Canon* of Avicenna. The *Firdausu'l-Ḥikmat* presents to us also, on the one hand, the high qualifications that were considered necessary for a recognised physician by the Arabic writers, and, on the other hand, the low and contemptible tricks that were practised by the charlatans in order to attract patients.[1]

Side by side with the Greek Medicine, it gives us a short, clear and coherent exposition of the whole system of Indian Medicine.[2] In this respect, as far as I know, it is unique in the whole Arabic medical literature. Thus this book laid the foundation-stone of the comparative study of the different systems of the Science of Medicine, a study which unfortunately was neglected by the followers of 'Alí b. Rabban and did not bear any fruit.

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[1] Part VII. Dis. 2. chap. 5.

[2] Part VII. Dis. 4. et. seq.

Over and above medical technical matters, the *Firdausu'l-Ḥikmat* contains some materials of philosophical, botanical, zoological, meteorological, astronomical and historical interests also. Most of them are the results of the personal observation of 'Alí b. Rabban himself.[1] These materials have been utilized by important writers on these subjects.[2]

After the 13th century, however, partly on account of some of its intrinsic defects, which were natural in the first compendium of Medicine, and partly because better compendiums were written in Arabic, by this time, the *Firdausu'l-Ḥikmat* was entirely neglected and became almost extinct.

Date of Composition.

'Alí b. Rabban began the composition of this book about the year 215 A.H./830 A.D.,[3] and continued it during his secretaryship of Mázyár b. Qárin, the ruler of Ṭabaristán, in his leisure hours. He had almost finished this work in the year 838 A.D. when it was interrupted for some time on account of the rebellion of Mázyár against the Caliph al-Mu'taṣim, which caused much trouble and anxiety to the author himself.[4] It was also hindered afterwards, when he became secretary to al-Mu'taṣim, on account of the great burden of official work that fell upon his shoulders.[5] He finished this work, however, at "Surra man ra'á" in the third year of the reign of al-Mutawakkil.[6] Having finished the composition of the book, he translated it into Syriac and circulated it far and wide, in order to make it more popular and useful, and also made a synopsis of it for the use of those who had no patience or time to go through the whole book.[7]

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[1] See *infra* pp. 84-85.

[2] See *infra* pp. 86-87.

[3] This date is based on the supposition that 'Alí became Mázyár's secretary when he was put in charge of Ṭabaristán by al-Ma'mún.

[4] *Firdausu'l-Ḥikmat*, p. 2.

[5] *Ibid.*, p. 2.

[6] *Ibid.*, p. 2.

[7] *Ibid.*, pp. 2, 8.

The Object.

The object of 'Alí in compiling this book was neither to comply with the request of his friends nor to please a prince or a caliph as generally had been the case with the works of this period, but only to do his duty, as a scholar well versed in Medicine, by writing a compendium comprising all the branches of Medical Science, to serve as a guide for the students of this science, for whom the need of a book of this type must have been felt by all interested in the promotion of the healing art. 'Alí in the introduction to the *Firdausu'l-Hikmat*, says that amongst the books written by the physicians he found many " Kunnáshát " (compendiums) by the Syrians and others in which the authors had confined themselves to one of the many different branches of the Science of Medicine. This led him to compile from them a book comprehending the virtues of the works of the ancients as well as those of the moderns, so that it might be a comprehensive guide to them all. In another place he claims credit for this compilation because he thereby saved students from the trouble of collecting the materials, and smoothed their way to this Art.[1]

This remark of 'Alí about the medical works of the Greeks and the Syrians is corroborated by other Arabic sources also. Hippocrates, Rhuphos, Galen, Philagrios and others had written a large number of medical books, but all their works as we know them from the lists given by Ibnu'l-Nadím, Ibnu'l-Qiftí, and Ibn Abí Uṣaybi'a, and from the published collections of the works of some of them, were either monographs dealing with particular diseases or treatises on some particular branch of Medical Science. Of the ancient physicians known to the Arabs, the only authors of medical compendiums were Oreibasios, Pauls of Aegina, Ahrun al-Qus and Georges the father of Bukhtyashú. Oribasios, who was probably the first compandium writer, compiled three compendiums: (*a*) Ἰατρικαὶ (ἀνταγωγαί) Συναγωγαί which consisted of seventy volumes, (*b*) Σύνοψις which consisted of nine

[1] *Firdausu'l-Hikmat*, Berlin, 1925, p. 3.

volumes, and (c) Συνόψιστε which consisted of four volumes.[1] None of them were complete according to our author, because the elements and their evolutions, the " complexions " and humours and faculties were not treated in these books at all. The same was the case with the Ὑπόμνημα of Paulos.[2] As regards the other two authors we have to depend upon the general statement of 'Alí b. Rabban himself because 'Alí b. 'Abbás, the only author whose criticism on the compendium of Ahrun we possess, does not say anything about its contents[3] while concerning the compendium of Georges we have not received any report.

Sources.

Feeling the necessity of a short self-contained medical compendium, 'Alí b. Rabban took up this task. He used a large number of the important works of his predecessors and contemporaries in his compilation. Though, while mentioning his sources, he has referred only to Hippocrates, Galen, Aristotle, Yúḥanna b. Másawayh and Ḥunayn the translator, only, alluding to others by the vague term " and others ", yet in the body of the book he has also referred to and quoted from the works of Pythagoras,[4] Theophrastos, Dioscorides, Democritos, Magnus of Emessa,[5] Alexander the traveller whom he calls al-Iskandar al-Ṭawwáf,

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[1] *al-Fihrist* ed. Flügel Leipzig, 1871, p. 292, *cf.* Neubergers, *History of medicine*, Oxford, 1910, pp. 302-303.

[2] *Kámilu'l-Ṣiná'at* of 'Alí b. 'Abbás, Cairo, Vol. I, pp. 2-3.

[3] *Ibid.*, Vol. I, pp. 3-4.

[4] Though now it is generally held that Pythagoras did not write any book (W. Smith's Dic. vol. 3, p. 620, col. 2), yet more than three treatises had been attributed to him in the middle ages (Thomas Stanley's *History of Philosophy*, London, 1887, pp. 511-512), some of which were translated into Arabic, (*al-Fihrist*, p. 245). The quotation in the *Firdausu'l-Ḥikmat* might have been taken from some of these treaties.

[5] Magnus has been referred to by Ibn Rabban, as the author of a treatise on Urine, (cf. *al-Fihrist*, p. 293). A copy of the Arabic translation of this book is preserved in the Berlin State Library, (Ahlwardt's *Catalogue* Vol. V, p. 501, No. 62324). But the Greek version of the same treatise is found in the collection of Galen's works.

Alexander the philosopher, Stephen, Arsalaus, who is probably Archelaos of Athens, and Archigenes (a name which is differently written in the different parts of the book, sometimes as Arkágháníś and sometimes as Arsájánís) and Axominos. To his contemporaries 'Alí has never referred in the body of the book. The names of Yúḥanna b. Másawayh and Ḥunayn do not occur therein even once. He has also referred in many places, to the opinions of the Chaldaeans, the Egyptians and the Indians in general without referring to any particular author or book.

The names of book quoted are generally not mentioned.

While referring to the authors mentioned above and quoting from their works, 'Alí has never mentioned the names of their books with the exception of the treatises of Hippocrates on the Embryo, on Prognosis, on Places and Waters, the commentary of Galen on the last treatise, and the treatise of Magnus on urine.

Kitábu'l-Falâḥat and *Kitábu Ṭabâ'i' al-Ḥayawán.*

He has also quoted from two other books—the *Kitábul-Falâḥat* [1] and the *Kitábu Ṭabâ'i' al-Ḥayawán* [2] without referring to the names of their authors. The quotations from the *Kitábu'l-Falâḥat*, we have been able to identify with passages in the *Kitábu'l-Falâḥat al-Nabaṭiyya* [3] of Ibnu'l-Waḥshiyya. But the book of Ibnu'l-Waḥshiyya, which is generally supposed to be a forgery [4] was written in the year 891 A.D., *i.e.*, forty-one years after the composition of the *Firdausu'l-Ḥikmat*.[5]

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[1] *Firdausu'l-Ḥikmat*, pp. 518; 520; 526-529, 536.

[2] *Ibid.*, pp. 524; 534.

[3] Berlin Lbg. 291 (Ahlwardt's *Cat.* 6204) ff. 2 b.—3. b. 8 a.—b.; 9 b.; 112 a.

[4] Dr. R. A. Nicholson's *Lit. Hist. of the Ar.* 1919, Int. p. xxv.

[5] As no other *Kitábu'l Falâḥat* by any other early Arabic writer has been reported by any bibliographer, this anachronism can be explained only by assuming that the *Kitábu'l-Falâḥat* is not a forgery as Prof. Nöldeke holds (Z.D.M.G.) but a translation of an earlier work (as its author says), to which 'Alí b. Rabban writing about

Indian works.

In the last discourse of the last part of the *Firdausu'l-Ḥikmat* 'Alí has referred to four Indian books, from which he has summarized the Indian

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forty years earlier, had referred by the Arabic translation of its name. In order to show that 'Alí had referred to this book and no other, we shall give here one quotation from the *Firdausu'l-Ḥikmat* and the corresponding passage of the *Kitábu'l-Falâḥat*. 'Alí b. Rabban says:—

قال صاحب كتاب الفلاحة اذا رأيت لعصافير تصوت صوتاً ضعيفاً او رأيت الغربان تطيرُ بسرعةٍ و نشاطٍ و تتقلّب في الهواء و تصوت اصواتاً متتابعةً او رأيت الطير يخرج من بين الشجر و يكثر الانغماس في الماء او رأيت الدجاج يكثر الاحتكاك في التراب او رأيت على اسافل القدور حين ترفع عن النار شراراً صغاراً فذلك كلّه يدّل على المطر و البرد - (pp. 520-21)

After a few lines again he says:—

و قال اذا رأيت ضوء السراج ليس بضيء و رأيت الغنم تسير و تنزوا نزواً كثيراً او رأيت الذئاب و الوحوش تقرب من العمران او رأيت ثمرة البلوط قد كثرت دلّ ذلك كلّه على طول الشتاء - (p. 521)

The corresponding passage from the *Kitábul-Falâḥat*:—

و من علامات تأخّر المطر باذن الله ان يرى ما يكون في الغياض من العصافير يصرين ليلاً صوتاً ضعيفاً و يرى الغدفان نشاطاً صاعقة تصوت (f. 16.) و اذا يرى الطير يجرجر من الشجر و الغياض فيكثرن الاطعمة فيه فذلك علامة شدة البرد و الغيث ' و اذا يرى في اسافل القدور حين ترفع عن اتافيها شرارٌ من نار فذلك علامة انزال الله الغيث و اذا يرى الدجاج يكثر الاحتكاك و التصويت و الكراكن و الخطاطيف عائدة على الماء يصوتن فذلك علامة الغيث ' و اذا رأى الذئب يدنو من عامر الارض فهذه كلها علامات الغيث ' و علامات طول الشتاء ان يكثر ثمرة البلوط و الفلفل ' و اذا رأى الحمار الاهلي قائماً مستقبلاً ذات اليمن عن القبلة و مغرب الشمس يحفر الارض بيده و ينظر الى السماء فذلك ايضاً من علامات طول الشتاء (f. 2. a—b.)

This and other quotations in the *Firdausu'l-Ḥikmat* and the corresponding passage of the *Kitábu'l-Falâḥat* show that 'Alí had used the *Kitábu'l-Falâḥat*, in original which was later on translated into Arabic by Ibnu'l-Waḥshiyya.

system of Medicine. These are (*a*) *Charaka*,[1] (*b*) *Susrúta*,[2] (*c*) *Nidâna* [3] and (*d*) *Ashtangahridâya*.[4]

Character of quotations.

In quoting his authorities 'Alí does not care for their words. In some places he summarizes long passages occurring in the original works, and in others he silently combines the passages or the ideas occurring in the original works in different places and refers the whole passage to his authorities. These quotations, so far as we have been able to identify them with the Arabic manuscripts of الفصول and تقدمة المعرفة of Hippocrates are on the whole correct.[5]

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[1] The name of this book occurs in British Museum manuscript of the *Firdaus* as *Kharak*. Ibnu'l-Nadím calls it *Sirak* (303). Avicenna refers to it as *Sharak* (*Canon* vol. I, p. 250). It was translated into Arabic from Persian by 'Abdu'l-láh b. 'Alí (*al-Fihrist* 303). The translator of the Persian version is not known. An English translation of the *Charaka* has been published by Avinash Chandra Kaviraka (Calcutta 1902).

[2] *Susrúta*, which is mentioned by Arabic authorities as *Susrud*, was translated into Arabic by the Indian physician, Manka, at the instance of Yahyá b. Khálid the Barmecid (*al-Fihrist*, p. 303). An English translation of this book has been published by Kunja Lal Bhishagratna (Calcutta, 1907).

[3] *Nidâna*, some parts of this book, which is mentioned by Arab authorities as *Badân* has also been translated into English.

[4] *Ashtangahridiya*, the name of which has been corrupted by Ibnu'l-Nadím as *Astanker*, and by Ibn Abí Uşaybi'a as *Asankar*, was translated into Arabic by Ibn Dhan (*al-Fihrist*, p. 303).

[5] Dr. E. Th. Withington, who has very kindly identified for me some of these quotations with the Greek originals, has pointed out in some cases that the Greek words are not correctly translated. Thus (p. 350), النفاخات في البول تدل على وجع الكلية و على رياح غليظة فيها ought to be acute disease of the kidney (*Aph.* 33-34 Littre); and (p. 35) قال البقراط ان الحمان من الناس اقل عمرا من المهازيل also is not quite correct because the Greek word ταχυθανατοι means sudden death and not earlier death (*Aph.* 2, 44 Littre.) He has shown such mistakes in some other cases also. But such mistakes, which must be due to the translators of Greek works into Arabic and not to 'Alí, are not many.

Having dealt with the date of the composition of the book and its sources we proceed to describe its general plan and division in different parts and their order, its contents, its influence on the later writers and the general character of its manuscripts that have come down to us.

The scope of the book.

According to 'Alí's conception of the Science of Medicine, it includes not only Physiology, Pathology, Anatomy, Pharmacology and other branches of Medical Science but also Natural and General Philosophy and Astronomy the knowledge of which was considered to be indispensable for a physician during the ancient and middle ages.

The plan of the book.

In dealing with the different parts of his subject in this broad sense our author's plan was to start with the most simple and fundamental things like ' matter ', ' form ' and the elements and their evolution, and proceed in the natural and logical way to the more complex, e.g. the embryo and the development of its different parts. Here after dealing with the soul, the internal and external senses and other mental phenomena he would proceed to discuss the complexion of the different parts of the body and the topics connected with them, and then with the bringing up and education of children, with what it is necessary to do in the different seasons of the year in order to preserve one's health, and with nutrition and dietetics. Having dealt with elementary matters, he would deal with general principles of Pathology and Therapeutics and then with the special Pathology of the different parts of the body, their diseases and their symptoms and treatment. This would be supplemented with general discourses on blood-letting and phlebotomy, on the pulse and on urinoscopy. Then would follow the materia medica and toxicology, which would be preceded by a general discourse on tastes, scents and colours which determined the properties of the drugs. The book would be concluded with general discourses on waters, winds and places, on the truth of the Science of Medicine, on matters

relating to Astronomy and with a summary of Indian system of Medicine based on the four Indian books already referred to.

The division of the book.

In order to carry out this plan systematically, 'Alí has divided the book according to the subject matter, into seven main parts, each of which is divided into a number of discourses, which are again subdivided into chapters. The First Part deals with first principles like matter and form and element and things connected with them; the Second Part with embryology and matters connected with it; the Third Part with dietetics; the Fourth Part with general and special Pathology; the Fifth Part with tastes, scents and colours; the Sixth Part with materia medica; the Seventh Part with climate, waters and winds, with Cosmography and Astronomy and with the utility of the Science of Medicine, concluding with a summary of Indian Medicine.

All parts are not of equal length.

The length and the number of discourses in the different parts, as well as the number of chapters in the different discourses vary greatly according to the magnitude and importance of the subjects treated in them. Thus the First, Third and Fifth Parts contain only one discourse, whereas the Fourth Part which is the longest and according to our author the most important of all contains twelve discourses, the Second Part five discourses, the Sixth Part six discourses, and the Seventh Part eleven discourses. The length of the chapters in the different parts differs in the same way. The chapters in the First, Second, Fifth and Sixth Parts are much longer in comparison with those in the Fourth Part where they seldom exceed one page.

We give below the contents of the book as fully as possible, so that the reader may form an idea of the wide range of the subjects which 'Alí intended to cover in this short compendium.

CONTENTS

PART I

Discourse 1

Chap. 1. On the book itself, its name, its author, and its sources.

Chap. 2. On matter, form, quality and quantity according to what the philosophers of different schools have said about them

Chap. 3. On the simple (primary) and compound (secondary) elements. It includes a refutation of those who believe that there is a fifth element.

Chap. 4. On the antagonism between these elements. It contains a section controverting those who hold that air is cold.

Chap. 5. On the change of the elements into one another.

Chap. 6. On metamorphosis.

Chap. 7. On genesis and decay.

Chap. 8. On action and reaction.

Chap. 9. On the genesis of things from elements and the influence of the heavens and stars on them.

Chap. 10. On the result of the action of the elements in the air and under the earth.

Chap. 11. On the shooting stars, and the different colours that appear in the air.

Chap. 12. On the genesis of the different kinds of animals, *i.e.*, the terrestrial animals, the water animals, and the birds.

PART II

Discourse 1

Chap. 1. On the embryo.

Chap. 2. On the different periods of the development of the embryo.

CHAP. 3. On what causes the male or the female child and their multiplicity and paucity.
On the cause of the birth of twin children, and on the completeness and defect of the parts of the body, etc.

CHAP. 4. On the signs of pregnancy and of the child's being male or female, etc.

CHAP. 5. On what Hippocrates has said about pregnancy and its signs.

CHAP. 6. On abortion and what makes the delivery easy.

CHAP. 7. On the temperament and the different parts of the body.

CHAP. 8. On the stomach and the process which the food undergoes therein, and the peculiarities of the four kinds of complexion.

CHAP. 9. On the involuntary and voluntary movements, and on brain, heart, nerves and veins.

CHAP. 10. On the cause of the roundness of the head, and what is indicated by the difference of its size.

CHAP. 11. On the number of openings in the head, and the outlets for superfluous matters.

CHAP. 12. On the discussion of skin, hair and nails and teeth.

CHAP. 13. On the cause of man's standing erect, the development of his hands and feet in their present form, and why he is taken as an epitome of the world (microcosm).

CHAP. 14. On the cause of tallness and shortness, fatness and thinness, and on the different colours of men.

CHAP. 15. On the cause of the growth of the beard, and of bald-headedness, and why men become grey in their old age, whereas the other animals do not.

CHAP. 16. On the cause of nocturnal discharge in case of men, and menses in case of women.

CHAP. 17. On the different parts of body, and their powers and functions.

CHAP. 18. On the ages of man, the seasons of the year and the the succession of night and day.

PART II

DISCOURSE 2

CHAP. 1. On the soul and that it is neither an attribute nor one of the complexions.

CHAP. 2. On the doctrine that the soul is not a compound substance and on motion and its different kinds. This chapter also contains a refutation of those who do not believe in motion.

CHAP. 3. On the relation of soul to body, that its existence in the body is not like the existence of some material things in others, and that light is neither body nor fire.

CHAP. 4. On the description of the soul (based on Aristotle, and Theophrastos), that there is more than one soul in the body, and that some of them perish with the body.

CHAP. 5. On intelligence, matter and the ten categories. This chapter is based on Pythagoras and Aristotle.

CHAP. 6. On phantasy, imagination and commonsense; their functions and relation to intelligence. This chapter contains an article on definitions.

CHAP. 7. On sight.

CHAP. 8. On the remaining external senses, their comparative merits and functions. It contains an argument in answer to some of the author's contemporaries who held that light is fire, that the object of eye-sight is fire, that the object of the sense of touch is earth, and that the brain is cold because if it were hot it would have burnt up.

CHAP. 9. On colours, tastes and smells, and that they are attributes and not body as some people hold.

CHAP. 10. On the faculties that control the growth of the body : the animal, the spiritual and the natural faculties ; their centres in human body, and their functions in life.

PART II

DISCOURSE 3

CHAP. 1. On the signs of human complexions, based on Galen.

CHAP. 2. On the signs of the complexion of the brain.

CHAP. 3. On the signs of the complexion of the heart.

CHAP. 4. On the signs of the complexion of the liver and the stomach.

CHAP. 5. On hunger and thirst, sleep and insomnia, laughter and weeping, and their physiological causes.

CHAP. 6. On happiness and sorrow, shame and fear and their physiological causes.

CHAP. 7. On desire, reason and anger, and the effect of the preponderance of one over another. It is based on Plato.

CHAP. 8. On bravery and cowardice, generosity and miserliness, forbearance and rashness, vanity and modesty, and love and enmity ; their internal and external causes, and their nature.

CHAP. 9. On intelligence and dullness, and memory and forgetfulness, and their physiological causes.

CHAP. 10. On sneezing.

CHAP. 11. On dreams, nocturnal discharge and nightmares and their physiological causes.

CHAP. 12. On visions and their different kinds, evil eye and the different explanations of it, the views of the Indian and Egyptian philosophers on the power of imagination ; the author's disinclination to believe in these things.

PART II

Discourse 4

Chap. 1. On the bringing-up of children, and methods to be employed to keep them healthy (based on Galen).
Chap. 2. On their training and education after they have grown up (based on Galen).
Chap. 3. On the preservation of health (based on Galen and Hippocrates).
Chap. 4. On the measures to be taken by men of different 'complexions' in different periods of their life in order to remain healthy, (based on Galen).
Chap. 5. On precautions to be taken in order to keep the different organs in normal condition.

PART II

Discourse 5

Chap. 1. On the measures to be taken in the spring season.
Chap. 2. On the measures to be taken in the winter season.
Chap. 3. On the measures to be taken in the autumn season.
Chap. 4. On the measures to be taken in the summer season.
Chap. 5. On what soldiers and travellers should do.
Chap. 6. On the causes of fatness and thinness.
Chap. 7. On different kinds of exercise, and the good or harm which they do to particular parts of the body.

PART III

Discourse 1

Chap. 1. On the cause of desire for food, and on its assimilation (based on Aristotle).
Chap. 2. On the quantity of food, and the order in which different foods should be taken.
Chap. 3. On different kinds of food, their properties, and their effects.

PART IV

Discourse 1

Chap. 1. On health and disease in general and the classification of the subject on different principles.
Chap. 2. On the general causes of disease.
Chap. 3. On diseases which occur in particular periods of life or particular seasons of the year.
Chap. 4. On diseases caused by the preponderance or disturbance in any one of the four humours.
Chap. 5. On the causes of the disturbance in the humours.
Chap. 6. On the symptoms of their disturbance.
Chap. 7. On the symptoms of internal diseases.
Chap. 8. On the general principles of treatment.
Chap. 9. On the principle of treatment of the different parts of the body.

PART IV

Discourse 2

On the diseases of each part of the body.

Chap. 1. On the diseases of the head. It contains some prescriptions used by the author himself.
Chap. 2. On injuries to the head.
Chap. 3. On brain afflictions.
Chap. 4. On the symptoms of different diseases of the brain. This chapter contains some interesting cases of the author's time, but he does not give the Pathological details of them.
Chap. 5. On the treatment of brain diseases.
This chapter contains many prescriptions, some of which were used by the father of our author.
Chap. 6. On such mental diseases as are due to the disorder of the stomach.
Chap. 7. On what Hippocrates has said about brain afflictions.
Chap. 8. On tinnitus, its causes and treatment.

CHAP. 9. On vertigo, its causes and treatment.
CHAP. 10. On forgetfulness, its causes and treatment.
CHAP. 11. On different kinds of headache, their causes and symptoms.
CHAP. 12. On the treatment of headache.
CHAP. 13. On the headache known as "Shaqíqa" which affects one half of the head, and its treatment.
CHAP. 14. On the headache known as " Sanwartá" which affects the whole head, its symptoms and treatment.

PART IV

DISCOURSE 3

CHAP. 1. On the structure and anatomy of the eyes.
CHAP. 2. On the diseases of the eyes.
CHAP. 3. On the symptoms of the different diseases of the eye.
CHAP. 4. On the treatment of eye diseases.
CHAP. 5. On the treatment of diseases of the eyelids, eye-lashes and on inversion of the eye-lids.
CHAP. 6. On the structure and anatomy of the organ of hearing, diseases of the ears, and their symptoms.
CHAP. 7. On the treatment of ear diseases.
CHAP. 8. On the diseases of the nose including their symptoms and treatment.
CHAP. 9. On nasal haemorrhage, its causes and treatment.
CHAP. 10. On nasal catarrh and its treatment.
CHAP. 11. On the diseases of the face and their treatment.
CHAP. 12. On the afflictions of the mouth and teeth.

PART IV

DISCOURSE 4

CHAP. 1. On spasm and tetanus, and other nervous afflictions, and their Pathological causes.
CHAP. 2. On the symptoms of spasm and tetanus.
CHAP. 3. On the treatment of spasm and tetanus.

CHAP. 4. On tremor, its pathological causes and treatment.
CHAP. 5. On paralysis and its pathology.
CHAP. 6. On the symptoms of the two kinds of paralysis.
CHAP. 7. On their treatment.

PART IV

DISCOURSE 5

CHAP. 1. On the nature, complexion and diseases of the throat and uvula, including diphtheria and angina.
CHAP. 2. On the symptoms of the diseases of the throat and uvula.
CHAP. 3. On the treatment of these diseases.
CHAP. 4. On affections of the chest and voice.
CHAP. 5. On their treatment.
CHAP. 6. On asthma.
CHAP. 7. On its treatment.

PART IV

DISCOURSE 6

CHAP. 1. On the stomach, its function and its diseases.
CHAP. 2. On the symptoms of the diseases of the stomach.
CHAP. 3. On the treatment of the diseases of the stomach and of consumption.
CHAP. 4. On vomiturition and its treatment.
CHAP. 5. On hiccough and its treatment.
CHAP. 6. On the treatment of the affections of the four powers of the limbs. viz., the power of attraction, retention, assimilation and repulsion.

PART IV

DISCOURSE 7

CHAP. 1. On diseases of the liver.
CHAP. 2. On the symptoms of the different diseases of the liver.

CHAP. 3. On dropsy and its three kinds, and its causes.
CHAP. 4. On the treatment of the diseases of the liver.
CHAP. 5. On the treatment of dropsy.

PART IV

DISCOURSE 8

CHAP. 1. On diseases of the heart.
CHAP. 2. On their symptoms and treatment.
CHAP. 3. On diseases of the lungs.
CHAP. 4. On their symptoms and prognosis.
CHAP. 5. On the treatment of the lungs.
CHAP. 6. On the treatment of cough.
CHAP. 7. On haemorrhage.
CHAP. 8. On the symptoms indicating the different sources from which the blood comes in case of haemorrhage
CHAP. 9. On the treatment of haemorrhage.
CHAP. 10. On gall-bladder and jaundice.
CHAP. 11. On diseases of the gall-bladder.
CHAP. 12. On the treatment of jaundice.
CHAP. 13. On spleen.
CHAP. 14. On the treatment of spleen.

PART IV

DISCOURSE 9

CHAP. 1. On diseases of the intestines, relaxation of the bowels and dysentery.
CHAP. 2. On the symptoms of the diseases of intestines, and of relaxation of the bowels.
CHAP. 3. On what Hippocrates has said on the subject.
CHAP. 4. On the treatment of relaxation of the bowels and dysentery.
CHAP. 5. On the intestine known as colon and the causes on account of which superfluous matters adhere to certain organs.
CHAP. 6. On the symptoms of colic pain.

CHAP. 7. On the treatment of colic pain and worms and taenia.
CHAP. 8. On diseases of the kidneys.
CHAP. 9. On the symptoms of kidney-diseases.
CHAP. 10. On the treatment of kidney-diseases.
CHAP. 11. On diseases of the bladder.
CHAP. 12. On the symptoms of diseases of the bladder.
CHAP. 13. On the treatment of diseases of the bladder.
CHAP. 14. On diseases of the orifice of urine.
CHAP. 15. On the treatment of these diseases.
CHAP. 16. On diseases of anus and their treatment.
CHAP. 17. On diseases of the womb including barrenness, abortion, hysteria, haemorrhage, uterine, suppression of the menses and swelling of the uterus.
CHAP. 18. On the symptoms of the diseases of the uterus.
CHAP. 19. On the treatment of these diseases.

PART IV

DISCOURSE 10

CHAP. 1. General observations on fever and its different kinds.
CHAP. 2. On the causes of febris diarrhoea.
CHAP. 3. On the nine different kinds of febris diarrhoea, and their treatment.
CHAP. 4. On the causes of hectic fever.
CHAP. 5. On the symptoms of hectic fever.
CHAP. 6. On the treatment of hectic fever.
CHAP. 7. On continuous fever and its symptoms.
CHAP. 8. On the treatment of continuous fever.
CHAP. 9. On febris pituitosa.
CHAP. 10. On the symptoms of febris pituitosa.
CHAP. 11. On the treatment of febris pituitosa.
CHAP. 12. On the causes of tertian fever.
CHAP. 13. On the symptoms of tertian fever.
CHAP. 14. On the treatment of tertian fever.
CHAP. 15. On quartan fever.

CHAP. 16. On the symptoms of quartan fever.
CHAP. 17. On the treatment of quartan fever.
CHAP. 18. On the semitertian and other complex fevers.
CHAP. 19. On the causes of intermittent fevers and the difference of their period.
CHAP. 20. On pleurisy, its symptoms and treatment.
CHAP. 21. On small-pox, its symptoms and treatment.
CHAP. 22. On the causes of fainting, perspiration and vomiturition, and their treatment.
CHAP. 23. On critical days.
CHAP. 24. On prognosis (taken from the book of Hippocrates).
CHAP. 25. On good symptoms in diseases (taken from Hippocrates).
CHAP. 26. On good, bad and intermediary symptoms.

PART IV.

DISCOURSE 11

CHAP. 1. On diseases of the hip-bones, and of joints, and on sciatica and gout.
CHAP. 2. On their treatment.
CHAP. 3. On tubercular elephantiasis, and its treatment.
CHAP. 4. On leprosy, etc.
C :36. 5. On the treatment of leprosy, etc.
CHAP. 6. On swellings.
CHAP. 7. On the symptoms of swellings.
CHAP. 8. On the treatment of swelling and gangrene.
CHAP. 9. On the treatment of wounds.
CHAP. 10. On operation.
CHAP. 11. On the number of muscles.
CHAP. 12. On the number of nerves.
CHAP. 13. On the number of blood-vessels.

PART IV

DISCOURSE 12

CHAP. 1. On bleeding.
CHAP. 2. On the benefits of bleeding.

CHAP. 3. On cupping.
CHAP. 4. On the general principles concerning the use of purgatives.
CHAP. 5. On baths.
CHAP. 6. On the pulse in general.
CHAP. 7. On difference in the pulse in different periods of life, and in different countries.
CHAP. 8. On the state of the pulse in sleep and walking and in thirst and hunger.
CHAP. 9. On the pulse in different diseases.
CHAP. 10. A general discourse on urine.
CHAP. 11. On white and thin, and white and thick urine.
CHAP. 12. On what the thinness of urine indicates.
CHAP. 13. On what the heat of urine is a symptom of.
CHAP. 14. On the oily urine.
CHAP. 15. On what floats in the middle of the vessel.
CHAP. 16. On sediment in urine.
CHAP. 17. On cysts.
CHAP. 18. On the bran like urine.
CHAP. 19. On mealy, sandy and fetid urine.
CHAP. 20. On what Galen has said about urine.

PART V

DISCOURSE 1

CHAP. 1. A general discourse on the properties of things.
CHAP. 2. On the number of tastes, their causes and properties.
CHAP. 3. On the action of each taste on the human body.
CHAP. 4. On smells.
CHAP. 5. On the causes of different colours.
CHAP. 6. On the reason why things melt and solidify, burn and putrefy and undergo other similar processes.
CHAP. 7. On the reason why things become dry and hot, and are torn or broken.
CHAP. 8. On mineral substances and the natural processes by which they are produced.
CHAP. 9. On the causes that produce vegetables, trees and fruits.

PART VI

Discourse 1

Chap. 1. On the properties of seeds.
Chap. 2. On the properties of herbs, pumpkins and cucumbers.
Chap. 3. On the properties of fruits.
Chap. 4. On the properties of the flesh of different animals.
Chap. 5. On the properties of the milk of different animals and their whey.
Chap. 6. On the properties of fishes.
Chap. 7. On the properties of oils.
Chap. 8. On the properties of rinds of fruits.
Chap. 9. On the properties of preserved fruits.
Chap. 10. On the properties of different kinds of vinegars.
Chap. 11. On the properties of different kinds of sweets.
Chap. 12. On the properties of salts.
Chap. 13. On the properties of spices.
Chap. 14. On the properties of the scents of different flowers.
Chap. 15. On the properties of other sweet smelling things.
Chap. 16. On the properties of cloths and skins of diffferent animals.

PART VI

Discourse 2

Chap. 1. On the simple drugs.
Chap. 2. On gums and medicaments drawn from the earth.
Chap. 3. On shells, mineral substances, smoke, ashes and vitriol.
Chap. 4. On the properties of different kinds of earth.
Chap. 5. On the purification and preservation of medicaments.

PART VI

Discourse 3

On purgatives.

PART VI

Discourse 4

Chap. 1. Properties of the different parts of man.
Chap. 2. Properties of the different parts of the horse.
Chap. 3. Properties of the different parts of the mule.
Chap. 4. Properties of the different parts of the cow.
Chap. 5. Properties of the different parts of the ass.
Chap. 6. Properties of the different parts of the ram and the sheep.
Chap. 7. Properties of the different parts of the goat.
Chap. 8. Properties of the different parts of the pig.
Chap. 9. Properties of the different parts of the dog.
Chap. 10. Properties of the different parts of the camel.
Chap. 11. Properties of the different parts of the mountain-goat.
Chap. 12. Properties of the different parts of the lion.
Chap. 13. Properties of the different parts of the elephant.
Chap. 14. Properties of the different parts of the leopard.
Chap. 15. Properties of the different parts of the wolf.
Chap. 16. Properties of the different parts of the hyena.
Chap. 17. Properties of the different parts of the bear.
Chap. 18. Properties of the different parts of the fox.
Chap. 19. Properties of the different parts of the mouse.
Chap. 20. Properties of the different parts of the weasel.
Chap. 21. Properties of the different parts of the hare.
Chap. 22. Properties of the different parts of the hedgehog.
Chap. 23. Properties of the different parts of the cock and hen.
Chap. 24. Properties of the different parts of the goose.
Chap. 25. Properties of the different parts of the pigeon, dove, heath-cock and turtle-dove.
Chap. 26. Properties of the different parts of the crane and its eggs.
Chap. 27. Properties of the different parts of the crow.
Chap. 28. Properties of the different parts of the partridge.
Chap. 29. Properties of the different parts of the sparrow.

CHAP. 30. Properties of the different parts of the falcon.
CHAP. 31. Properties of the different parts of the bat, swallow, bustard and hoopoe.
CHAP. 32. Properties of the different parts of the flies and locusts.
CHAP. 33. Properties of the different parts of the castoreum.
CHAP. 34. Properties of the different parts of the crab, tortoise, and skinks.
CHAP. 35. Properties of the liniment made of fish and of salt water.
CHAP. 36. Properties of the different parts of the frogs and leeches.
CHAP. 37. Properties of the different parts of the snakes and their slough.
CHAP. 38. Properties of the different parts of the scorpion and gecko.
CHAP. 39. Properties of the different parts of the spiders and lice.
CHAP. 40. Properties of soup and fat.
CHAP. 41. Properties of milk and cheese in general.
CHAP. 42. Properties of butter and whey.

PART VI

DISCOURSE 5

CHAP. 1. Poisons.
CHAP. 2. Different kinds of poison and their treatment.

PART VI

DISCOURSE 6

CHAP. 1. Compound medicines and theriacs.
CHAP. 2. Compound purgatives.
CHAP. 3. Lozenges.
CHAP. 4. Compound digestive medicines.
CHAP. 5. Rob, syrups, oxymel and lily-wine.
CHAP. 6. Oils.
CHAP. 7. How to drink the milk of different animals.
CHAP. 8. Unguents.

PART VII

Discourse 1

Chap. 1. Cities, waters and winds and their influence on health.
Chap. 2. Towns and the influence of their situation on health.
Chap. 3. Different kinds of water and their properties.
Chap. 4. Causes of the saltiness and coolness of water.
Chap. 5. Waters and the cause of the perpetual flow of rivers.
Chap. 6. Countries and their influence on the complexion and character of their peoples.
Chap. 7. Climate and its influence on body and soul (temperament).
Chap. 8. Winds and their influence on health.
Chap. 9. Seasons and their influence on health.
Chap. 10. Atmospheric phenomena foreshadowing the character of coming seasons, etc.
Chap. 11. Certain characteristics of some birds and animals showing the character of coming seasons, etc.

PART VII

Discourse 2

Chap. 1. Answer to those who do not believe in the truth of the Science of Medicine.
Chap. 2. Properties of some things which counteract the effect of fire and ice.
Chap. 3. Properties of certain vegetables which strengthen or counteract the effect of other vegetables.
Chap. 4. Some interesting examples of the characteristics of animals and waters.
Chap. 5. Certain devices employed by some physicians.

PART VII

Discourse 3

Chap. 1. The eternity of the heavens and the stars, and the fact that God moves them without being moved.

CHAP. 2. The arrangement of the different heavens and their revolutions.
CHAP. 3. The movements of the planets.
CHAP. 4. The roundness of the heavens and the earth.
CHAP. 5. Distances of the planets from one another.
CHAP. 6. Answer to those who assert that the heavens and elements are infinite.

PART VII

DISCOURSE 4

CHAP. 1. Indian Medicine.
CHAP. 2. Classifications of this Science.
CHAP. 3. Qualifications necessary for a student of Medicine.
CHAP. 4. The physicians should not be hasty in undertaking the treatment of patients.
CHAP. 5. Procreation of men and animals.
CHAP. 6. The embryo and its formation.
CHAP. 7. The function of the humours and the effects of their excess or deficiency.
CHAP. 8. Measures to be taken for the preservation of health and their advantages.
CHAP. 9. The superfluous matters of the body and the harm caused by suppressing them.
CHAP. 10. The harm caused by taking different things in excess.
CHAP. 11. Different kinds of water and their properties.
CHAP. 12. Different tastes, and what the physicians should know about them.
CHAP. 13. Food, and the arrangement of different courses.
CHAP. 14. What should be taken with different kinds of wine.
CHAP. 15. Wine and how it should be drunk, and persons who should abstain from it.
CHAP. 16. The milk of different animals and its properties.
CHAP. 17. Measures to be taken in the different seasons of the year for keeping healthy.

CHAP. 18. On universal morals (based on the works of the Indian physicians).
CHAP. 19. General causes of disease.
CHAP. 20. Different kinds of disease.
CHAP. 21. How to know the different stages of disease in a patient.
CHAP. 22. Particular causes of diseases.
CHAP. 23. What is caused by the preponderance of each humour.
CHAP. 24. Methods of treatment.
CHAP. 25. Hiccough.
CHAP. 26. Cough and its treatment.
CHAP. 27. Thirst.
CHAP. 28. Symptoms of relaxation of the bowels and of consumption.
CHAP. 29. Fever and its symptoms.
CHAP. 30. Treatment of fever.
CHAP. 31. Venesection and when it should not be resorted to.
CHAP. 32. Symptoms of convalescence and of death.
CHAP. 33. Evil spirits.
CHAP. 34. Purgatives and emetics.
CHAP. 35. Medicines for diseases of the uterus.
CHAP. 36. Compound medicines.

Matters of general interest in the *Firdausu'l-Ḥikmat.*

Apart from these medical philosophical and astronomical topics, the *Firdausu'l-Ḥikmat* contains matters of general interest some of which are given below :

(1) Matters relating to Ṭabaristán and its inhabitants :—

(*a*) The people of Ṭabaristán used to believe that in the night of the new moon, the wine stored in the cellars *stirs*, and gets mixed with the dregs ; hence they used to throw the dregs out before the appearance of the moon and then return the wine to the cellars (p. 22).

(*b*) In the mountains of Ṭabaristán mice used to collect round the persons who were attacked by leopard and therefore the natives used to avoid it in order that they might not be surrounded by mice (p. 446).

(*c*) 'Alí b. Rabban sent a commission to inquire about mount Danbáwand (Damáwand). On their return they reported that it took them more than two days and nights to reach the summit of the mountain which, on being surveyed, was found to be thirty *Jaribs* in extent. It was covered with sand (ashes?) in which the feet sank. They did not find there any living birds or animals on account of the excessive cold and the violent wind that blows over it. They also found thirty craters which emitted sulphurous fumes and rumbling noises from which they concluded that there was flaming fire under the mountain. Round these craters they also found sulphur, yellow like gold, some of which they brought to ' Alí in bags (p. 549, *et. seqq.*)'

(2) Matters of general interest :—

(*a*) In the author's time there was a class of mediocre writers who used to adapt the books written by others and publish them in their own names (p. 8).

(*b*) During the lifetime of 'Alí many earthquakes occurred in Danbáwand (Damáwand) and Farghána. On one occasion a big town was completely destroyed (p. 24).

(*c*) One of the slave-girls at ' Surra man Ra'á ' lived up to the age of 120 years. Her teeth grew again after they had fallen out and her hair also became black after having grown grey (p. 53).

(3) Matters of zoological interest :—

Most of the wolves in Ṭabaristán were accompanied by some small animals, and many snakes carried other snakes on their backs. Once there appeared in Ṭabaristán, during the four spring months, a small bird which resembled a sparrow. Every morning a sparrow came to it, and the above-mentioned bird after feeding the sparrow for the whole day ate it up at night.

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[1] This passage of the *Firdaus* has been quoted in the *Táríkh-i-Ṭabaristán* of Ibn Isfandyár (G. W. Gibb, ser. II., pp. 35-36), but there is much difference between the original and the quotation.

We also find in the *Firdausu'l-Ḥikmat* some formulas by means of which the dates of solar months may be determined with reference to the date of lunar months.[1]

It would be easy to give further instances of the valuable information contained in this book but what we have selected may serve for the present purpose.

The recognition of its importance by the later writers.

It was on account of its contents, that this work was not only read and referred to, by the later writers, but was also considered by them as one of the chief authorities. The great historian Muḥammad b. Jarír al-Ṭabarí was found reading this book while he lay ill in bed and it is included amongst the great authorities which, Ṣáḥib Ismá'íl b. 'Abbád, the renowned patron of learning, was censured for regarding it as inferior to his own.[2]

Quotations in medical works.

It has been quoted by many important Arabic medical writers The greatest of them, al-Rází, who was a student of 'Alí, has referred to him in many of his works, as al-Ṭabarí, and has quoted from the *Firdausu'l-Ḥikmat* in many places. In his *Kitábu'l-Fákhir*,[3] al-Rází has quoted a long passage from Part 4, Discourse 2, Chapter 3, and more than half of the last Part of Chapter 4 of the same Discourse of the *Firdausu'l-Ḥikmat*.[4] In *al-Ḥáwí*, a posthumous work, he has quoted from this book

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[1] P. 552.

[2] Professor Browne's *Arabian Medicine*, pp. 38-39.

[3] This book of al-Rází is not published, and is rare even in manuscripts. Professor E. G. Browne possessed a good manuscript copy of this book which he had kindly deposited in the Cambridge University Library for my use. It is marked Browne. or. Ms. p. 2. It measures 16 × 11 c.m. It was written by Muḥammad b. 'Abdu'l-Razzáq al-Káshání in legible Nasq, on shining yellow paper, in the year 1005 A.H. It contains 465 folios, *i.e.*, 930 pages; each page with 18 lines. Folios 14, 442, 443 and 457 are missing and folio 277 is misplaced. The book is divided into two volumes and deals only with special Pathology and Therapeutics.

[4] Browne or. Ms. p. 2. ff. 57 a to 58 b.

in many places.[1] Dr. A. Mingana says that it is also quoted by Badruddín al-Qalánísí in his *Aqrábádin* and by Nafís al-Kirmání in this commentary on *al-Asbábu wa'l-'Alámát*.[2]

Quotations in other works.

Apart from the medical writers, historians, geographers, botanists and others also have taken their materials from this book—*e.g.*, al-Bírúní,[3] al-Mas'údí,[4] Yáqút al-Hamawí,[5] Ibn Isfandyár,[6] Ibnu'l-Bayṭár,[7] Abu'l-Mu'ayyad al-Balkhí.[8]

The defects of the book and their influence on its popularity.

This book, however, has many defects some of which are natural in the first Arabic medical compendium. The discourses on Philosophy, Astronomy, and in answer to those who did not believe in the utility of Medical Science may have been incorporated in this work, because the knowledge of these sciences was thought necessary for a physician and because of the strong views of some of the eminent scholars of the time of 'Alí like al-Jáḥiẓ, against this science, but they cannot be considered as branches of Medical Science. On the other hand, the undue importance given by 'Alí to these subjects caused him to neglect entirely some important parts of the Science

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[1] Bodleian. Marsh, 156, ff. 147 a.-b; 195 a.; 197 a. 211 b; 283 a.; etc.

[2] *The Book of Religion and Empire*. Int. XIV.

[3] *India* Eng. tr. Sachau, London, 1910, Vol. 1, p. 382. Professor Sachau says that al-Bírúní's source on Medicine was *Charaka* in the Arabic edition of 'Alí b. Zain. (Int. p. XL). But really it is the quotation from the quotation from the *Charaka*, in the *Firdausu'l-Ḥikmat*. Al-Bírúní himself says "The book *Charaka* as quoted by 'Alí b. Zain." (Vol. 1, p. 382).

[4] *Murújul-Dhahab*, Vol. 8, p. 326. Edition de Meynard.

[5] *'Ajá'ibu'l-Buldán*, ed. Wüstenfeld, Vol. III, p. 507.

[6] Professor Browne's translation, pp. 35-36.

[7] *Jámi'ul-Mufradát*, Cairo, Vol. 1, pp. 107; 160; Vol. 3, pp. 4, 5, 24, etc.

[8] Professor Browne's manuscript of *'Ajá'ibu'l-Ashyá*, Browne, or. Ms. G. 11 (12) f. 68. a. Most of the quotations in these books we have compared and identified with passages in the *Firdausu'l-Ḥikmat*.

like Obstetrics and Surgery, and to treat others such as Anatomy in a cursory manner. While the book, therefore, retained its importance as a mine of miscellaneous information, at least, till the 13th century, as it is evident from the quotations from this book in the *Mufradát* of Ibnu'l-Bayṭár and the *Tárikh-i-Ṭabaristán* of Ibn Isfandyár, yet it lost its value, as a medical compendium as early as the 10th century, when it was eclipsed by the works of al-Rází and other eminent physicians and became obsolete.

It is not mentioned by 'Alí b. 'Abbás and Nizámí 'Arúḍí.

It must be due to this that 'Alí b. 'Abbás has not mentioned the name of the *Firdausu'l-Ḥikmat*, in the introductory chapter of his *Kámilu'l-Ṣiná'at*, in which he has discussed the merits and defects of all the important medical compendiums that were then extant, Nizámí 'Arúḍí, the author of the *Chahár Maqála*, also who was himself a physician, has not mentioned the *Firdausu'l-Ḥikmat* in the list of the works which, according to him, students of Medicine should read and physicians should possess. It is difficult to believe that these authors of note did not know the *Firdausu'l-Ḥikmat* at all, when we consider that the later writers, to whom we have already referred, made use of the scanty materials that were found in this book, with regard to their subjects, in spite of the fact that it did not fall within their proper scope. As for 'Alí b. 'Abbás it is evident that he knew this work and perhaps also utilized it in writing his own, because the first chapter of the first volume of the *Kámilu'l-Ṣiná'at* is mainly an amplification of the introductory part of the *Firdausu'l-Ḥikmat*.

The extant manuscripts.

Having lost its worth as a medical compendium, while the incidental matters mentioned in the book were incorporated by writers on the subjects to which they properly belonged, the *Firdausu'l-Ḥikmat* gradually became almost extinct. It was translated neither into Hebrew nor into Latin in which were rendered so many Arabic medical works. The author's own Syriac translation of it has been lost. Even the original Arabic version became so rare that, at the present day, so far as we

know, only four Mss. of it are extant: one in the British Museum (Arundel, Or, 41),[1] the second in the Stadt Bibliotheque at Berlin (Landberg, 266).[2] The third Ms. is in the Rámpúr Library (in India) and the fourth was in the private library of late Ḥakím Kamál'ud-Dín of Lucknow.[3] There is another copy of the philosophical and astronomical part of the book only, at Gotha (856, A. 1910).[4]

Having dealt with the life and works of 'Alí, we proceed to deal with him as a scholar, as an author and as a medical man, and then we shall give his ideas on the different branches of Medical Science.

'Alí as a scholar.

As a scholar 'Alí richly deserves a place in the first rank of the Arabic medical writers of the first-half of the ninth century A.D. He was a linguist, well versed in Syriac, Hebrew[5] and Arabic besides Persian, a theologian well-acquainted with the important religious literature of the Jews, the Christians and the Muslims, and a physician conversant with most of the important works on Medicine, ancient as well as those of his own time, including Indian Medicine. He had an inquisitive mind, thirst for knowledge, and some power of observation, which are essential qualities of a scholar. But he lacked originality and that independence of judgment and courage without which no scholar can avoid the persistent errors of his predecessors. This weakness he shows at many places in the *Firdausu'l-Ḥikmat*. At one place referring to the influence attributed to the evil-eye and to the talismans that were found in Egypt, he repudiates them as imaginary, but he seems to hesitate

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[1] J. Forsballs *Catalogue of Arabic* Ms. p. 217.

[2] W. Ahlwardt's *Catalogue*, Vol. 5, p. 513. The Ms. is now in Tübingen Library.

[3] For a complete description of these Mss., see *Firdausu'l-Ḥikmat*, Berlin, ed. M. Z. Siddiqi, Int. pp. كز – كمه.

[4] Pertch *Catalogue*, p. 456.

[5] Professor Nöldeke thinks that 'Alí did not know Hebrew at all (*Deutsche Literaturzeitung*, Jan. 1924, Col. 24). But some passages in the *Kitábu'l-Dini wa'l-Daulat* (pp. 67, 81, 84) clearly show that 'Alí

in saying so, because just after this he says that he knew similarly strange phenomena of nature, some of which are mentioned by Galen and Dioscorides, and that still stranger things are mentioned in the revealed books.[1] He believed in charms, wrote a book on them [2] and has mentioned two such prescriptions in the *Firdausu'l-Ḥikmat*.[3]

'Alī as an author.

As an author, so far as we can judge from his extant works, he is always well-grounded and well-read in the subjects on which he writes, he has great power of exposition and a simple straightforward style,[4] treats the subject logically and systematically, and always keeps in view the standard of his readers and his own main purpose. But he shows in the *Firdausu'l-Ḥikmat* some lack of the sense of proportion. He devotes too much space to Philosophy and Astronomy, and describes in detail such problems as the categories, the sun, the moon, and the other planets, and their distances from one another, etc., which are matters in no way connected with Medical Science. Anatomy and Physiology he passes over quite cursorily. He does not show this deficiency, however in the *Kitābu'l-Dīni wa'l-Daulat*, which he wrote after the *Firdausu'l-Ḥikmat*.

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knew Hebrew well enough to understand the Hebrew text of the *Old and New Testaments*, and compare them with their Syriac translations and point out the differences between them.

[1] *Firdausu'l-Ḥikmat*, pp. 95-96. In the *Kitābu Ḥifẓi'l-Ṣiḥḥat 'Alī* tries to explain some of the theories of Indians, which he repudiates in the *Firdausu'l-Ḥikmat* (see Bodleian Marsh 413 f. 7a.)

[2] See p. 47.

[3] *Firdausu'l-Ḥikmat*, pp. 280-281.

[4] A passage in the *Tārīkh-i-Ṭabaristān* (Prof. Browne's tr. p. 43) has caused some misunderstanding about 'Alī's mastery of Arabic language (Nöldeke, Deut. Litz. Jan. 1, 1924, Col. 26). We compared Prof. Browne's translation with the Persian manuscript of the same celebrated Orientalist and found that the sense of the Persian text was not well-expressed in the Eng. tr. The Persian text runs thus:—

'Alí's method.

In the *Kitábu'l-Dini wa'l-Daulat* and the *Firdausu'l-Ḥikmat*, 'Alí gives in their introductions a short and general criticism of the previous works on their subjects and explains the object which he had in writing his own. In the *Firdausu'l-Ḥikmat* he also mentions the sources on which it is based. Having thus introduced the subject, he first discusses certain general principles bearing on it and then passes on to the more concrete and practical parts, and supplements the whole with some discourses in which he replies to the objections of his opponents. In the *Firdausu'l-Ḥikmat* he begins every part with the discussion of some general principles connected with that part of Medical Science.

'Alí and his readers.

'Alí does not write for any particular class of readers, nor does he expect any previous knowledge of the subject from them. He tells them all that he wants them to know. Even while writing on philosophical and astronomical subjects he describes them in detail, in simple language, so that the readers may not have to refer to any other work in order to understand him.

'Alí as a medical man.

As a medical man 'Alí had a very high idea of the Medical Science as well as of the medical profession. He held that this was the best and the noblest of all sciences.[1] In his opinion as in that of Hippocrates and also

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ولي بن زين را خليفه بعد ازو (مازيار) بديوان انشاے خويش بنشاند ' معاني نوشتهاے كه مينوشت كمتر ازان آمد كه بعهد مازيار براے او مينوشتند ' از او پرسيدند چرا چنان است گفت آن معاني او بلغت خويش مينوشت من بتازي كردمے

According to this passage the difference in richness in meaning between the different despatches written by 'Alí himself—some as secretary of Mázyár and some as secretary of Mu'taṣim—was observed by some people. Being asked about it 'Alí said that the despatches which he wrote as secretary of Mázyár were really only translations of what was written by Mázyár in Persian whereas what 'Alí wrote as secretary of Mu'taṣim was his own composition. Hence the difference was in the ideas (not in the language employed).

[1] *Firdausu'l-Ḥikmat*, p. 4.

Susrúta the students of this science should be of good family, comely in countenance, sound and clean in body, compassionate, dignified and well versed in all branches of science.[1] He advises those who wish to acquire thoroughness in this science not only to read his book, the *Firdausu'l-Ḥikmat*, but also to study the works of the ancients and constantly associate with experts, (in order to acquire practical training).[2] According to 'Alí a medical practitioner, even though he excels in the theory and practice of this science, is not perfect unless he is chaste, contented and compassionate. Moreover, he should have more sympathy with the patients than their own relations, should exert himself more in deeds than in words, should seek renown in this world and reward in the next, and should not be eager for pecuniary profit. He should not be self-asserting and loquacious, nor light in conduct nor overbearing, nor self-conceited nor aggressive, nor should he delight in the mistakes of his colleagues, but strive to conceal their errors.[3] He should also be intelligent and quick-witted, and ready to encourage the patients by his remarks.

Diagnosis.

The physician should not begin the treatment until he has properly diagnosed and understood the disease. Having diagnosed it properly, he should try to remove its real cause, according to the principles of *contraria contrariis*, taking into consideration the season of the year, the age and the complexion of the patient, his diet when he was healthy, his habits, his profession, the place of his residence and the health of his parents.[4] He should avoid the use of medicine

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[1] *Firdausu'l-Ḥikmat*, pp. 5-6.

[2] *Ibid.*, p. 8.

[3] *Ibid.*, p. 4.

[4] *Firdausu'l-Ḥikmat*, p. 129. 'Alí attached much importance to the habits of individual patients. He says that the conditions and things amongst which one is born, as well as those to which one is habituated, suit him best. The insects which live in poisonous substances, die when they are taken out of them and put in honey. He knew cases of many sailors who fell ill on account of good food and sweet water and in spite of treatment did not recover so long as they were not given fish, dates and stinking water.

so long as it is not absolutely necessary, and should abstain from the use of poisonous and injurious drugs.'[1]

'Alí's ideas of different branches of medicine.

'Alí, however, as we have already stated possessed no originality of ideas. The whole of his compendium on Medicine as he himself has confessed, is no more than a compilation based on Greek works. His general and natural Philosophy is mainly derived from Aristotle, his Physiology and general as well as special Pathology and Therapeutics are chiefly taken from Hippocrates and Galen. His Pharmacology is based on Dioscorides, Theophrastos and Galen and his Astronomy is founded on that of Ptolemy and others.

His ideas about matter and form and elements.

'Alí believed in the theory of Matter and Form, the first of which is the source and origin of the elements. These are of two kinds: Primary and Secondary. The primary elements are the four qualities—heat, cold, moisture and dryness; the secondary consist of their compounds, Earth, Fire, Water and Wind which are generally known as the four elements. They are antagonistic to one another as well as interchangeable. The capacity for change depends on the degree of antagonism. The greater the antagonism between two elements, the easier is their change into each other. This change is known as استحالة or metamorphosis. It is called كون or genesis if the change is for the better and higher form, and فساد if the change is for the worse or lower form.

It is from the combination of the secondary elements, the parts of which differ in heaviness and lightness, that everything in the world is produced. All kinds of differences in these things are due to the predominance of some of the elements. The plants cannot move because the heavier parts of earth predominate in them. Some animals live underground because lighter parts of earth predominate in them; others live in water or airy

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[1] *Firdausu'l-Hikmat*, p. 5.

places because water or air predominates in them. On the basis of this theory, 'Alí has tried to explain other characteristics of certain animals, the difference in their colour, and also the difference in the features of the inhabitants of various countries.[1]

His Physiology.

The heart, the brain and the liver are principal organs. The heart is hot and moderately dry. It is the seat of the " spiritus vitalis ", the source of the " inherent warmth " the centre of the veins and is subject to permanent natural motion which is reflected in the pulse. It has two ventricles : one is on the right which is the place of blood, the other is on the left which is the place of pneuma.[2] The brain is the coldest and the most moist organ in the body but the inherent heat transmitted from the heart keeps it warm. It is the seat of " spiritus animalis " the centre of nerves, the source of voluntary movements and of the senses.[3] The liver is the home of blood, the seat of the "spiritus naturalis", and the centre of the jugular veins. It changes the chyle into blood and keeping its own share of it, passes it to the heart.[4]

Though the heart, the brain and the liver are the only " noble organs " yet the stomach, the gall-bladder, the spleen and the lungs also play important parts in controlling the normal activities of the organism. The lungs pass cold fresh air to the heart, and temper its heat, the gall-bladder keeps the stomach and the liver warm and helps in digestion and purification of blood, the spleen tempers the heat transmitted by the heart and the gall-bladder, to the stomach, and causes desire for food by the acidity which it transmits to the stomach.[5]

D'gestive processes.

There are three processes of digestion. The first digestion takes place in the stomach which being helped by the warmth that it receives from the

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[1] *Firdausu'l-Hikmat*, pp. 9; 11; 14-15; 28-30; 35-36; 50; 53.
[2] *Ibid.*, pp. 43; 225.
[3] *Ibid.*, pp. 43-44; 83, etc.
[4] *Ibid.*, pp. 83; 208.
[5] *Ibid.*, pp. 208; 218; 241.

heart, the liver and the gall-bladder, changes the food into chyle. Chyle is conveyed to the "intestinum jejunum", and from there through fine hidden ducts to the liver where the second digestion takes place. The liver transforms it into blood, and transmits the purer portion of it to the heart and the rest to the other organs where the third digestion takes place. It is in the liver that the food is dissolved into the elements, and from there the fiery part goes to the gall-bladder, the earthly part to the stomach and from there to the intestines, and the watery part to the kidneys and from there to the bladder.[1]

Each part of the organism possesses four natural powers: the attractive power by which it draws its nourishment from the liver, the retentive power, the digestive power, and the repulsive power which throws out the useless residuum.[2]

His Pathology.

The Pathology of 'Alī like his Physiology is mainly based on Hippocrates and Galen. He gives a prominent place to the theories of the four humours, of qualities and of plethora. Disease is described as what injures the organism or disturbs the function of the organs and a middle state between health and disease is recognised.[3] Four internal causes of disease are mentioned:

(1) collection of superfluous matter in the diaphragm, (2) hot and acute matter, (3) retention of wind in the diaphragm, (4) disorder of any of the four humours.[4]

This may be due to any of the seven external causes: (1) deterioration of the atmosphere (2) plethora and emptiness (*i.e.*, eating too much or too little), (3) sleeping too much or too little, (4) long uninterrupted rest, (5) exhaustion, (6) mental suffering like sorrow, fear or anger, (7) accidental injuries like fracture.[5]

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[1] *Firdausu'l-Hikmat*, p. 208.
[2] *Ibid.*, p. 83.
[3] *Ibid.*, pp. 11, *et seq.*, 121.
[4] *Ibid.*, p. 123.
[5] *Ibid.*, pp. 121-123.

These external causes lead to the disorder of the humours; and the disorder of each of them causes some particular disease. Small-pox, acute inflammation and certain kinds of gout, for example, are due to disorder in the blood; jaundice, quartan fever, and gangrene are diseases of the yellow bile; dropsy and relaxation of the organs and of the parts of the body are caused by disorder of phlegm; madness, black jaundice, elephantiasis are due to disorder of black bile.[1]

Diseases fall into three categories: (1) disease of the homogeneous parts, (2) disease of the individual organs, (3) disease of the whole organism. Functional diseases also fall into three groups: (1) that in which the affected organ does not work at all, (2) that in which it does not work freely, (3) that in which it works improperly.[2] Again, some diseases are acute and fatal, like diphtheria, some are chronic like phthisis, some are epidemic, some are not curable, like ileus and gout. In some diseases healthy organs are affected sympathetically like the brain in stomach diseases. Some are contagious and pass from father to son like epilepsy, phthisis and tubercular elephantiasis. Some lead to other diseases, like dysentery which leads to diarrhoea, and inflammation of the liver and spleen which lead to dropsy.[3]

His therapeutics.

In his Therapeutics 'Alí seems to be more Hippocratic than Galenic. He held nature to be the great healer which should be helped by the physician. He seems to attach more importance to the details of individual cases than to the so-called Therapeutic laws.[4] Treatment by medicine, according to him, should be the last resort, because the same medicines that act favourably in some cases do harm in others, a result which might be due to the difference of the causes of disease, or of season or of the age

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[1] *Firdausu'l-Ḥikmat*, p. 122.

[2] *Ibid.*, p. 121.

[3] *Ibid.*, p. 122, *et seq.*

[4] See supra, p. 90, f.n. 1.

of the patients, or to the mistake of the physician in determining the dose of the medicine, or because it did not come from the place where the best of its kind is to be found, like cumin from Kirman and epithem from Afrîṭia.'[1](?)

The general principle of treatment advocated by 'Alî, however, is contraria contrariis. The disease due to the predominance of any of the four humours should be treated by their contraries. Evacuation is the principal remedy for plethora, and suitable diet is the main remedy for emptiness. Rest should be resorted to for disease due to exhaustion. The main object of physicians should be the removal of the real cause of disease.[2] For the treatment of disease of the organs five general rules are laid down: (1) to bring the affected organ back to its natural 'temperament'; (2) to turn the matter from the higher to the lower part of the body, from the right to the left, from the left to the right, and from the "noble organs" to the accessory ones; (3) the "noble and the sensitive organs" should be treated differently from the other organs; (4) the external and hollow parts of the body should be treated by means of comparatively weak medicines; (5) the superfluous matter should be evacuated by the easiest means: from the intestines by means of purgatives, from the stomach by the use of emetics, from the chest and lungs by gargles and expectorants, from the liver, the spleen and the bladder by diuretics. The superfluous blood pervading the whole organism should be evacuated by bleeding, and plethora by purging or causing perspiration.[3]

Epidemics.

Epidemic diseases are due to the deterioration of the atmosphere. In them the physician should try to purify the atmosphere, evacuate the superfluous matter from the body, and be careful about the diet.[4]

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[1] *Firdausu'l-Ḥikmat*, p. 5.
[2] *Ibid.*, p. 129, *et. seq.*
[3] *Ibid.*, p. 132, *et. seq.*
[4] *Ibid.*, p. 130.

His pharmacology.

The substances are divided into two groups: food and medicaments. Food is the substance which nourishes the human organism, and medicaments are those which give rise to certain changes in it.[1] The latter have certain properties which may be determined from their tastes. Sweet substances, for example, nourish the organs, bitter ones purify the chest from thick superfluous matter, sour substances purify the ducts.[2] Medicaments have also other properties which cannot be known but by experience. Lodestone draws iron; the powder of burnt scorpion has an affinity for the bladder, and is specially useful for the stone in it; poisons kill life; antidotes counteract poisons. Such properties cannot be learnt but by experience.[3]

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[1] *Firdausu't-Hikmat*, p. 399.

[2] *Ibid.*, p. 356, *et. seq.*

[3] *Ibid.*, p. 356.

CHAPTER VII

Some Persian Medical works produced in India

The interest of Muslim Kings and nobles of India in its arts and sciences.

The Muslim nobles and scholars, not long after their settlement in India, began to take active interest in its arts and sciences. They learnt the language of India. They patronized the cultivation of Indian arts and sciences; some of them made a thorough study of certain branches of them and wrote independent books in Persian on one or the other of them.

One of the important Indian sciences which attracted the special notice of the Muslim nobles and scholars of India, was the Indian system of Medicine. A good many books have been written on it in Persian in India since the pre-Mughal period, some of them being wholly or mainly based on Indian system of Medicine.

These medical works produced in Persian by the Muslims of India differed widely from those Persian works on the subject which were produced in Iran since the 10th century. The *Dhakhira-i-Khwārizmshāhi* the earliest Persian comprehensive medical work written in 521 A.H./1127 A.D., which has been described by Browne,[1] for example, follow the general plan of the earlier Arabic works on Medicine. They treat only the Greek theories with regard to medical problems. They do not show any trace of the influence of the Indian system of medicine except in prescribing some of the Indian drugs.

The earliest Persian medical book written in India.

The earliest book on Medicine written in Persian in India is, however, the *Ma'danu'l-shifā-i-Sikandar-shāhi* or *Sikandar Shāh's Mine of Medicine*. It was composed in 918 A.H. (1512 A.D.) by Mian Bhowa, on the basis of more than a

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[1] *Arabian Medicine*, pp. 98-99, 110-111.

dozen of authoritative Indian medical works, and was dedicated to Sulṭán Sikandar Lodí. It has been recognised by the Muslim historians and scholars as one of the most important works on the subject, and has been discussed by some of the European scholars since the 19th century.

Its compiler.

Mian Bhowa [1] the compiler of this book was one of the greatest nobles of Sulṭán Sikandar Lodí, and held the offices of the Ḥájib-i-Kháṣ (Lord Chamberlain), the Mír-i-'Adl (Chief Justice) and of the Wazír-i-Ā'zam (Prime Minister) under him. The Sulṭán also bestowed upon him the titles of Masnad-i-'Álí (highly placed) and of Khawáṣ Khán,[2] probably after the death of his father. His father who is known only by his title Khawáṣ Khán was an important Amír and trusted general of the Lodies. He was famous for his generosity towards the poor and the beggar, and had great respect for the saints and sufis who in their turn had sincere affection for him.[3]

His education.

Khawáṣ Khán gave his son the sweet name of Mian Bhowa just as many high-born Muslims, some of pure Turkish discent gave their sons such Indian names as Chhajju (Malik Chhajju the cousin of Balban) Kachhchan, Ḥamíd Rája [4] Qáḍí Piyára, Bhikan Khán (son of 'Álam Khán Lodí), Shaykh Budh,[5] Jumman, Budhan,[6] Dudha; Mian Bhowa, however, appears to have inherited from his father all

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[1] There are wide differences among the authorities in the reading of the word Bhowa. The *Tabqát-i-Akbari*, pp. 315, 329, 339 and 340, etc. The *History of Firishta* has it as Bhura and Bhure, pp. 18, 184, 187 and 190. The *Muntakhab'ul Tawárikh*, p. 327, etc. *Taḥqiqi Muṭálae*, pp. 152 and 153.

[2] Rieu's *cat.* Vol. II, pp. 471-72, *Tabqát-i-Akbari*, Vol. I, p. 339.

[3] Sir, H. Elliot, *History of India*, Vol. IV, pp. 528-32.

[4] Baraní, pp. 170-73; *The Foundation of Muslim Rule in India*, p. 289.

[5] *Tabqát-i-Akbari*, Vol. I, pp. 323-347.

[6] *Maktúbát-i-Quddusia*, pp. 38, 57, 82, 132, 146, etc.

his qualities of head and heart. He was given good education under the patronage of Sultán Sikandar Lodí, as he says in his introduction to the book in question. He acquired sound knowledge of Persian, Arabic and Sanskrit as his book shows. He developed good taste for letters and love for the society of the learned and literary men. The author of the *Wáqi'át-i-Mushtáqi* who was a contemporary of Mian Bhowa, says, "He used to associate with the learned men. The great men of the age assembled round him. He got together fine caligraphists and learned men and employed them in writing books on every science. He brought books from Khurásán and gave them to learned and good men. Writers were continually engaged in this work." [1]

His interest in Indian culture.

Mian Bhowa had interest in mysticism also. He had great respect for the Muslim mystics, particularly for Shaykh ' Abdul Quddús of Gangoh in the district of Saháranpur (d. 945/1538) Mian Bhowa was probably a spiritual disciple of him also. The Shyakh had affection and regard for him.

His interest in mysticism.

Mian Bhowa, however, on account of his wisdom and sagacity and hard work and generosity not only gained the love and affection of the people at large but also wielded great influence at the court and with the sultan for several decades. His unrivalled position in the court made other nobles jealous of him. They poisoned the ears of the sulṭán against him. But Mian Bhowa on account of old age and weakness of his faculties failed to counteract the evil designs of his enemies. He was consequently cruelly killed by his rival Malik Ādam at the command of Sulṭán Ibráhím Lodí in the second year of his reign. After his death all his titles and high offices were conferred by the Sulṭán on his son Diláwar Khán [2] to whom Shykh ' Abdul Quddús Gangohí wrote a letter of

His popularity caused his death.

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[1] Sir, H. Elliot, Vol. IV, pp. 451, F.N.

[2] *Tarikh-i-Khanjahan Lodi*, Ed. by S. Imamuddin, Asiatic Society manuscript, fol. 199.

sympathy. In this letter he referred to Mian Bhowa as Masnad-i-'Ālí (highly placed) described him as one of the friends of God, having love for Godly men and always putting at their disposal whatever he had. The Shaykh adds in this letter that his (Mian Bhowa's) death was a great blow to the sufis in general and to him in particular, for his stay in this country was due to his persuation.[1]

His interest in Indian music.

Bhowa was also keenly interested in Indian music and Indian Medicine. He persuaded and instructed one of his friends, Ḥammád, to compile a book on Indian music on the basis of Sanskrit works on the subject. The book was compiled and was dedicated to Sulṭán Sikandar Lodí. A unique manuscript of it is preserved in the library of the University of Lucknow.[2]

His interest in medical science and his book on the subject.

Mian Bhowa, however, had extraordinary interest in the Science of Medicine. He got together the physicians of India and Khurásán (Persia) collected together the books on the Science of Medicine, got selections made out of them and compiled a book on the subject which he called the *Ma'danu'l-shifá-i-Sikandarshâhí* or *the Mine of Medicine belonging to Sikandar Shâh*.[3]

In the introduction to this book explaining the reasons on account of which he compiled it, he writes :—" It has been learnt by experience that the Greek system of Medicine does not suit the people of India, nor does it agree with the climate of this country. And as the name of the medicaments are mentioned in the Persian

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[1] The *Maktubat-i-Quddusiyya*, Letter No. 62, pp. 85-86—*The Maktubat* contains five letters (Nos. 30, 47, 48, 49 and 58) addressed to Khawás Khán. But it is difficult to determine with certainty whether these letters are addressed to the father or to the son, both of them having the title of Khawás Khán.

[2] The manuscript has been described by Dr. Nazir Ahmad in *the Islamic culture*, Vol. 28, pp. 410-17.

[3] واقعات مشتاقی quoted by Elliot, Vol. IV, pp. 451. F.N.

and Greek languages, they cannot be identified in these lands and many of them are not even available in this country. It is, therefore, necessary to make a thorough study of the books of the Indian physicians, which serve as magnate for the diseases of the bodies as well as for the defects of temperament. But none of the books of the Indian physicians comprehends all the various branches of the Science of Medicine and none of them makes its readers entirely independent of the others. In addition to all this they are written in confused language and involved style. The request of this humble servant, therefore is that, as it was at this court that he received the crumbs of the table and got the gleanings of science and taste for knowledge which he readily assimilated, he wishes to compile in Persian a book comprehending all the branches of Medicine. Whatever the exalted command might be issued to him in this respect, he would consider it his duty to obey. The orders were issued from the Exalted Court: 'O you having the ability, do something, and render into Persian which is the sweetest of all the languages, the substance of all the principles contained in the medical works of the Indian physicians. It will bring you large recompence and great admiration'. Thus this humble servant in spite of numerous impediments and constant engagements took the trouble and rendered this book into Persian out of Sanskrit works, in order to please the patron and do good to others, for its benefits would reach the high as well as the low, the nobility as well as the common people. While writing it, he kept some of the technical terms which were not in use in Persian, just as they were in Sanskrit, explaining fully their significance in Persian. And some of the terms which were in use in Persian he mentioned in their Sanskrit forms also in order to clarify their meanings. He put together in this book extracts from the medical works of (1) Susrúta, (2) Charaka, (3) Gatu Karṇa, (4) Bhoja, (5) Bheda, (6) Vag Bháṭa, (7) Rasa Ratnákara, (8) Sárṇgadhara, (9) Banga Sena, (10) Chintá Maṇi, (11) Madhava Nidána, (12) Chakra Datta,

The cause of its compositions.

Its Sanskritic sources.

(13) Gaya Dutta (Gaya Dasa?) and others, which were in use and were tested by experienced. And as this book comprehended all the medical principles it was named as *Sikandar Shâh's Mine of Medicine*, benefiting the commons as well as the intelligentsia. By the grace of God the book was finally compared in the year 918 A.H./1512 A.D. It is divided into an introduction and three chapters." [1]

The introduction is divided into two parts. The first part deals with the definition of Science of Medicine and its high importance, according to the traditions of the prophet of Islâm and the Qur'án. The second part deals with the fundamentals of the Science of Medicine.

Its plan and contents.

Chapter I deals with the preliminaries of the treatment according to Indian system. It consists of 32 sections dealing with :—

(1) The instructions to students as to the class of physicians with whom they may study the science ;

(2) the various stages of the treatment ;

(3) The description of the six tastes and the various seasons of the year ;

(4) The making of various instruments which are used by the physicians (surgeons) ;

(5) Various kinds of operations and their practice ;

(6) The practice preparatory to doing operations ;

(7) The enquiries and observation which the physicians should make with regard to their patients ;

(8) The practices which should be followed in treating certain class of diseases ;

(9) The method of preserving the health ;

(10) The benefits of various drinks ;

(11) The good and evil effects of various eatables and drinks;

(12) The preparation of various electuaries ;

(13) The signs showing the increase and decrease of the three humours, etc. ;

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[1] معدن الشفای سکندر شاهی Lucknow edition, p. 3.

(14) On the conditions produced by the excess in any of the three humours, etc., and the diseases caused by it;

(15) The symptoms showing the curability or incurability of the disease;

(16) The good or bad omen showing the hope of ultimate recovery or otherwise of the patient;

(17) The description of medicaments which purify and bring back to equilibrium, any excess in them;

(18) The description of weights and measures;

(19) The names of some of the medicines used by the Indian physicians;

(20) The feeling of the pulse;

(21) The description of emitics and their preparation;

(22) The purgatives and their preparation;

(23) The method of guarding the king and the army from various kinds of poisons and other dangers;

(24) The description of what the physician must know before starting the treatment of a patient;

(25) The signs showing the prevalence of a particular element in a particular country and the description of the countries the drugs of which should be used in the treatment;

(26) The various kinds of tastes;

(27) The description of things which are beneficial or harmful in every respect or are beneficial in certain respects and harmful in other respects;

(28) Some medicaments for inflamation, boils and tumours;

(29) Certain particular classes of medicaments and their usefulness in the treatment of diseases;

(30) The description of the various kinds of iron instruments which are to be used (in operations) in particular diseases;

(31) The method of nursing the patients suffering from wounds;

(32) Peculiarities of blood and other humours, etc.[1]

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[1] *Ma'danu'l-Shifá'i Sikandari*, Lucknow, pp. 6-92.

Chapter II on the conception and the anatomy of human being. It consists of nine sections :

(1) On the semen of men and the menstural blood of women ;

(2) On conception :

(3) On the formation of *embryo* and its various parts ;

(4) On the description of the limbs and their parts and their numbers ;

(5) On the delicate parts in human body;

(6) The character and number of veins ;

(7) On the principles of blood-letting ;

(8) On the origin of veins which are called *Dhamani* in Indian language ;

(9) How the pregnant women should live.[1]

The third chapter deals with the symtoms of the various diseases and their treatment. It contains 87 sections dealing with :—

(1) The division of the symptoms of diseases and their causes ;

(2) The fevers and their symptoms and their treatments;

(3) Diarrhoea its symptoms and treatment ;

(4) Chronic diarrhoea ;

(5) Piles, its symptoms and treatment ;

(6) The diseases of digestion ;

(7) The diseases of worms, and their symptoms ;

(8) Jaundice and the like, their symptoms and treatment ;

(9) The disease of blood coloured bile (Raktapitta), its symptoms and treatment ;

(10) The disease of Consumption (Rájrog), its symptoms and treatment ;

(11) Cough, its symptoms and treatments ;

(12) The disease of hiccup and huping cough (Hikka-hukhuk), its symptoms and treatments ;

(13 Asthama, its symptoms and treatments ;

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[1] *Ma'danu'l-Shifái Sikandari*, pp. 92-119.

(14) The disease affecting the sound of the throat, its symptoms and treatment;

(15) The loss of appetite, its symptoms and treatments;

(16) The disease of vomitting, it symptoms and treatment;

(17) Dropsy, its symptoms and treatments;

(18) Fainting, its symptoms and treatment;

(19) The diseases caused by drinking wine, their symptoms and treatments;

(20) The two kinds of insanity, their symptoms and treatments;

(21) Epilepsy, its symptoms and treatments;

(22) Rheumatism, its symptoms and treatments;

(23) Erysieplas (bátrakta), their symptoms and treatments;

(24) Urustambha (paraplegia), its symptoms and treatment;

(25) Anupát (Amlapitta—a form of gastritis), its symptoms and treatment;

(26) The colic pain (Sula), its symptoms and treatments;

(27) Digestion-colic (pariṇamsūla), its symptoms and treatment;

(28) The Flatulence of the bowels *udávarta* (اُدادورت), its symptoms and treatments;

(29) Wind in the bowels (nafkh-i-shikam) the Indian name of which is Anah, its symptoms and treatments;

(30) Flatulence from indigestion (gola), its symptoms and treatments;

(31) Heart diseases, their symptoms and treatments;

(32) Diseases of the chest, their symptoms and treatments;

(33) Gonorrhoea, its symptoms and treatments;

(34) Retentions of urine and their thirteen kinds, their symptoms and treatments;

(35) Stone in the bladder, its symptoms and treatments;

(36) Spermatoria (sailán-i-mani), its symptoms and treatments;

(37) The excess of fat (med-rog), its symptoms and treatments;

(38) Udar-rog (Dropsy), its symptoms and treatments;

(39) Inflamation, its symptoms and treatments;

(40) Hydrocele, its symptoms and treatments;

(41) An eruption (budh) of body (shikanj), its symptoms and treatments;

(42) Scrofula, its symptoms and treatments;

(43) Elephantiasis, its symptoms and treatments;

(44) (Bata Rakta?) بدہ ردہ, its symptoms and treatments;

(45) Boiled sore (brana), its symptoms and treatments;

(46) The fistula, its symptoms and treatments;

(47) Tumour (bhokandar), its symptoms and treatments;

(48) A kind of wound in penis, its symptoms and treatments;

(49) Another kind of inflamation in penis (سکھہ دکھہ Sukha dosh), its symptoms and treatments;

(50) Lucodarma Shvat and leprosy, their symptoms and treatments;

(51) Eczema زحمت اودورد وسیت پت وکوتھہ udarda (Eruptive urticaria), sitapitta (urticaria), Kotha (Inflametary urticaria), etc., their symptoms and treatments;

(52) The diseases caused by sour *talkha*, their symptoms and treatments;

(53) A kind of boil, its symptoms and treatments;

(54) Blisters affecting the body, their symptoms and treatments;

(55) Masus Rumanti (Masorika—small-pox, Romantica-measles), their symptom and treatment;

(56) The diseases which do not harm much, their symptoms and treatments;

(57) The diseases which take place inside the mouth, their symptoms and treatments;

(58) The diseases of the ear, their symptoms and treatments;

(59) The diseases of the nose, their symptoms and treatments;

(60) The diseases of the eye, their symptoms and treatments;

(61) The diseases of the head, their symptoms and treatments;

(62) The excess of menses, its symptoms and treatments;

(63) Disturbance of moisture in women's body and its discharge through urinal passage, its symptoms and treatments;

(64) The treatment by which a woman may be made pregnant and that by which her affection may be gained ;

(65) The diseases of the female organ, their symptoms and treatments ;

(66) The treatments of some of the diseases from which a pregnant woman suffers ;

(67) The diseases of the mamma, their symptoms and treatments ;

(68) Galactogouges ;

(69) The diseases of children, their symptoms and treatments;

(70) Various kinds of poisons and their antidotes ;

(71) The treatments for improving the sexual power ;

(72) The treatments by which grey hairs may turn black ;

(73) Purification and calcification of metals and precious stones, etc. ;

(74) Preparation of drinks ;

(75) Oily and similar drinks :

(76) Heating ;

(77) Treatments of vomitting and diarrhoea and the class of patient to whom this treatment may do good ;

(78) Complications arising out of vomitting and diarrhoea (purtab kun probably Persian Partáb-i-kún), etc. ;

(79) Treatment by enema (clyster) ;

(80) Evil effects of enema ;

(31) Nose drops ;

(82) Treatments by means of churned sour milk and by gargling and by putting tablets in the mouth and by applying obscure medicine on teeth and so on, and treatments by means of smoking ;

(83) Blood letting ;

(84) Treatments of pityriasis and acidity ;

(85) Treatment by means of cupping or branding ;

(86) Number of diseases and descriptions of the changes in the humours ;

(87) Miscellaneous.

At the end the author reiterates his statement in the introduction that he owed everything including his scientific attainments to Sultán Sikandar Lodí and that he composed this book according to his command, and prays that the common people as well as the nobles may be benefitted by this book and requests the scientists and the physicians to read the book carefully and do justice to it for it lays down the principles of Medical Science and the secrets of about one thousand and one hundred and sixty-seven diseases and the effects of various medicaments.[1]

Other Sanskritic sources.

In the body of the book however, he refers every now and then not only to the sources which he has mentioned in the introduction but also to some other Indian medical works like the book of *Jog Mukta wali*,[2] and *Rasmotajarbati*.[3]

His faithfulness to his Sanskritic sources.

I am not competent to judge the exactitude and faithfulness of the author of this book, Mian Bhowa while quoting or referring to the Sanskrit Medical works but the general method of the treatment of the subject matter by him, shows that he tried his best to convey to his readers the exact idea expressed in the sources which he utilized. It is of course a mere guess. But this guess is strongly supported by the well-founded judgment of Dr. E. Haas

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[1] *Ma'danu'l Shifá*, pp. 490-91.

[2] *Ma'danu'l Shifá*, p. 139. Jog mukta wali is a collection of prescriptions or recipes from several medical books. It was in the form of Ayorvedic pharmacoepia. It was collected in about the 14th or the 15th century. The book as well as the name of the author are not available. But other better collections are now available in the market.

[3] *Ma'danu'l Shifá*, p. 252. It is perhaps the corrupted form of Rasarajpaddhati, a book on murcarian preparation. It was compiled between 11th and 13th centuries. The author's name is not available.

For this information I am indebted to Kaviraj V. K. Bhattacharyya, M.A.

who in his long and learned article[1] on the origin of Indian Medicine has quoted a long passage from chapter one section 23 of the *Ma'dan* (pp. 74, *et. seq.*) and identified it with chapter 34 of the *Susruta*[2] and has remarked that the author took great pains to get at the deep sense of the original Sanskrit work and took equally great care in translating it into Persian.

He further adds, " I can, however, say that I also compared chapters 12 and 14, (chapter 1, sections 12 and 14) with the text of the *Susruta* I, 38 and 21 and found the translation quite exact, there being only a few small additions or omissions." [3] It was probably necessary for the sake of expressing the sense of the original in the translation.

I have been able to verify this statement with the kind help of Kaviraj Vijayakali Bhattacharyya, M.A. It must be said, however, that many of the Sanskrit terms are wrongly printed in the Lucknow edition of 1294 A.H./1877.

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[1] E. Hass—Z.D.M.G., Vol. 30 (1876), pp. 617-670. In this article Dr. Hass has *enpassent* discussed several important basic problems, *e.g.*, the translation of Indian medical works into Arabic in the 8th and 9th centuries A.D. and the compilation of the *Ma'danu'l Shifá* by Mian Bhowa a Muslim Prime Minister of Sulṭán Sikandar Lodí. He is of opinion that the Indian medical works could not have been translated into Arabic in a period when the Muslims were not in touch with Northern India, which was the centre of Indian culture, nor could a book like the *Ma'danu'l Shifá* be compiled by a Muslim prime minister of an enemy of the Hindus and Hinduism like Sikandar Lodí. He therefore thinks that the *Ma'dan* was really composed by the eminent Indian physician Bhavamisra of Banaras who lived in the 16th century. But later researches and discoveries show that his contention on both these counts are based on mere guess which are not warranted by facts. This may be easily seen by a perusal of the present chapter of the present book. A comparison of the contents of the *Ma'dan* with those of the latest edition of the *Bhavaprakassa* also show that the two works are independent of each other dealing with the common subject matter. For this comparison I am indebted to Dr. P. B. Chakravarti of the Asiatic Society.

[2] Z.D.M.G., Vol. 30, pp. 635-641.

[3] Z.D.M.G., Vol. 30, p. 641.

The appreciation of the book by some Indian historians.

It appears that the *Ma'danu'l-Shifá* since the time of its compilation attracted the notice of the Muslim scholars and writers, some of whom appreciated and admired it. The author of the *Tárikh-i-Mushtáqí* who has already been quoted has described this book [1] as one of the greatest authorities on its subject. In the *Tárikh-i-Dáúdí*, its author remarks, "By the order of Sulṭán Sikandar and with the effort of Mian Bhowa on the basis of the Indian medical works was compiled an admirable book on the Science of Medicine. It is known as *(Ṭib)-i-Sikandarí* and has been the basis of the treatment of patients by the physicians (scholars) of India. This book which is one of the monumental works of Mian Bhowa is an addition to the medical literature of the world." [2] Similar appreciative remarks concerning the *Ma'danu'l-shifá* have been made by some other historians and scholars also.

The Dasturul Aṭibbá of Firishta.

It was not long after the compilation of the *Ma'dan* that the famous historian Firishta compiled his book *Dastúru'l Aṭibbá* or *Ikhtiyárát-i-Qásimí* dealing with the Indian system of Medicine. In compiling this book he was guided by the same considerations as had impelled Mian Bhowa to compile his book. Firishta composed his book [3] about the year 1590, soon after he had entered the service of Ibráhím Ādil Sháh II before beginning the composition of his well known history.[4] In the introduction to the book he writes, "The writer of these pages Moḥammed Qásim entitled as Hindúshāh commonly known as Firishta studied the noble Science of Medicine as deeply as possible and spent a

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[1] Elliot, Vol. IV, p. 451.

[2] The Khuda Bukhsh Library (Patna) manuscript of the *Tarikh-i-Dáúdí*, No. 100/Persian, fol. 41-a.

[3] This book should not be confused with another book of the same name which has been noticed by Abdul Muqtadir in his *Cat. of the MSS.* in O.P.L., Vol. XI was compiled by Zainul 'Aṭṭár and was supplimented by a materiamedica named *Qarábádin Jalálí* by himself.

[4] The *Encyclopaedia of Islam*, the artice, Firishta.

part of his valuable life on it. After the perusal of the books on the subject commonly used in Iran, Turkey and Arabia, his mind turned towards the study of the works of the Indian physicians. He found their theories as well as their practice of Medical Science extremely well-founded. He therefore thought it necessary to compile a book dealing with their medical principles and their application and with their system of treatment of diseases which at the outset appeared to be strange. For there were many Muslim friends living in this country who had no thorough knowledge of the ever changing climate of this country nor were they well aware of the systems of treatment followed by Indian physicians. In this book therefore he mentioned the properties of the drugs and of the victuals and their names which were difficult to pronounce. Thereby he also wanted to leave behind something by which he might be remembered. Verse :—

It is in short a work which may remind of me because the life does not continue for ever." [1]

Its contents.

The contents of the book which are more or less identical with those of the *Ma'dan*, have been described by Rieu and Ethe in their *Catalogues*.[2] It appears, however, that Firishta closely associated with the Hindu practitioners of the Indian system of Medicine of his time to several of whom he refers in this book.[3] It shows that there had developed by the time of the author a close relation between the practitioners of the Indian and the Greek systems of Medicine in India.

After the *Ma'dan* and the *Ikhtyârât-i-Qâsimi* there were composed in Persian in India a good many books either on the whole system of Medicine or on a branch of it on the basis of Indian works. Some of these books have already been published and others are preserved in the well-known Indian or European libraries and are described in their catalogues.

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[1] Asiatic Society, MS. No. 1553, fol. 1-3.

[2] Rieu supptt., p. 113, Ethe, India Office Lib. Cat. Nos. 2318-2324; Bodl. Lib. Cat. No. 1601.

[3] Fol. 17b.

CHAPTER VIII

Contribution of Arabic and Persian medical writers to medical science.

Recapitulation.

In the previous chapters we have seen how Arabian Medicine originated in the Ummayyad period, and developed under the 'Abbásids, and what were the causes that led to the quick development of the vast and varied Arabic medical literature in such a short space of time. We have also seen that by the end of the 9th century Arabic medical literature possessed not only the whole of the important medical literature of the Greeks and many important medical works of the Indians, but also many independent works which were planned and executed by the Arabic writers themselves. Now we will see to what extent these writers adopted Greek or Indian systems, how far they were influenced by each of them and what independent contributions they made to Medical Science. Though the present writer does not possess any of the many-sided qualifications, which are rightly considered by the best authority on the subject,[1] to be indispensable for the purpose, except in so far as he can study the Arabic medical works in their originals, yet in order to supply some materials for the really qualified writers who may attempt to solve this problem, he gives the results at which he has arrived through the study of these works.

Indian system did not appeal to Arabic writers.

Though many Indian medical works were translated into Arabic,[2] in the early 'Abbásid period, yet Indian system of Medicine, which is based on Indian Philosophy, did not appeal to the more realistic minds of the Arabic medical writers who, from the beginning, were influenced by the Hellenic Culture. 'Alí b. Rabban who, as far as we know, stands unique

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[1] See Professor Browne's *Arabian Medicine*, pp. 112-113.

[2] See pp. 34-35.

among them in devoting one part of his compendium, with which we have already dealt in detail, to the systematic treatment of Indian Medicine, refers in many other places also to the ideas of the Indians about some medical problems and discards them as being imaginary. At one place, for example, he says that the Indians think " that fever and other diseases are cured by the force of patient's imagination ". " They hold still stranger views " he continues, " which I would not like to mention even if they were true."[1] At the beginning of the Discourse which treats of Indian Medicine he says : "In what I have written (about Indian Medicine) there are many points on which the Indians and the Greeks agree and there are others in which they differ. In such cases I fail to follow the reasoning of the Indians ".[2] In the Chapter treating of spirits from the Indian point of view, he says " Whatever I write in this and other Chapters I write as a narrator and not as a follower ".[3] From these remarks of 'Alí b. Rabban who had read at least five important Indian medical works, in order to summarise from them their system of Medicine,[4] one can judge how little was he influenced by it. In other Arabic medical works that we have read, we found very scanty references to *Charaka* concerning the properties of certain drugs or the peculiarities of certain diseases.[5] From all this we may conclude that if Arabian Medicine was influenced by Indian Medicine, it was only in Therapeutics and not in any other branch.

Greek Medicine was adopted by Arabic medical writers.

It was the Greek medical system that was adopted in its entirety by the Arabic medical writers, and was blindly followed by some of the physicians of the early 'Abbásid period. Mikhá'íl b. Másawayh is a striking example of this type.

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[1] *Firdausu'l-Hikmat*, p. 96.

[2] *Ibid.*, p. 557.

[3] *Ibid.*, p. 588.

[4] See p. 56.

[5] *al-Hávi* (Bodleian Marsh, 156 FF. 185b; 202 a.), Canon vol. 1. p. 250.

He never used such medicines as had come into use less than two hundred years before his time. He therefore never prescribed oxymel and some other medicaments without honey. One being asked about banana, he said that the ancient physicians had not mentioned it in their works, and what was not mentioned by them he neither took himself nor did he advise others to take.[1] But there were at the same time other physicians in Baghdád who knew that Medical Science was then only in its infancy. Yúḥanna b. Másawayh the brother of Mikhá'íl himself, writes in his *Kitábu'l Nawádir al-Ṭibbiya* that we should have regard for what has been accomplished by the ancients, specially by Galen, and must have faith in them, till the time when the Science of Medicine is established. Then our faith in them would be discarded, what would not be proved to be right would be suspected and our medicaments would be pure substances.[2]

But what did the Arabic writers do in order to achieve this end?

The independent achievements of these writers in Pharmacology and Ophthalmology have already been recognised.[3] What to us appears to be their greatest service to Medical Science is the great stress laid by them, on the practical training of the students of Medicine, and the tendency shown by some of them to shake off the slavish mentality of Mikhá'íl, to whom we have already referred, and others of his type, to make experience the real basis of theory and to apply inductive method, instead of the old deductive process, to the Science of Medicine.

The great contrast which we find between the system of education in the medical school of Alexandria, as we know of it through the *Ṭabaqátu'l-Aṭibbá* of Ibn Abí Uṣaybi'a,[4] and the system of education in the Arabic medical schools, lies in the

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[1] *Ṭabaqátul-Aṭibbá*, vol. 1, p. 183.

[2] Göttingen Arab 99, F. 170 b.

[3] See Dr. E. Th. Withington's *Medical History*. Pp. 172-75; Max Neuburger's *History of Medicine*, 1910, p. 380, J. Herschberg*.

[4] Vol. 1, pp. 106-109.

practical training of the students. While in the school of Alexandria this side of instruction was entirely neglected. The physicians of the Arabian school attached great importance to it. We have already seen what 'Alí b. Rabban has said about it.[1] Al-Rází, his pupil in the last chapter of the 4th Discourse of *Kitábu Manṣúri*, says that in choosing a physician one should consider whether he is well-read in the ancient and modern medical literature, has associated with expert physicians and has attended large number of patients. Al-Majúsí says that " the student of medicine should constantly attend the hospitals and sick-houses, pay unremitting attention to the circumstances and conditions of their inmates in company with the most acute professors of Medicine ".[2] It was probably for the sake of the practical instruction of the students that Ibráhím b. Baks delivered lectures on Medicine in the hospital of *'Aḍudul-Dawlah* itself.[3] The pupils of al-Rází attended his patients in his presence and it was only when they had failed that he himself attended them.[4] In the Bimáristán al-Fáriqí in Mayyáfáriqín, there was a Majlisu'l-'Ilm (scientific association) in which medical problems were discussed. Záhidul-'Ulamá who was probably the director of this hospital attended the meeting of this association and his answers to questions put to him in this association formed a part of one of his books.[5] All this show that the students of Medicine were given an opportunity to clarify their ideas of Medical Science both in theory as well as in practice. One interesting example of practical instruction is mentioned by Dr. E. Th. Withington in his *Medical History*.[6]

The interest in the practical Medicine created an interest in clinical observation and actual clinical cases. In *al-Ḥávi*, al-Rází has devoted one whole chapter to the description of such

[1] See p. 95.
[2] Prof. Browne's *Arabian Medicine*, p. 56.
[3] *Ṭabaqátu'l-Aṭibbá*, Vol. I, p. 244.
[4] *Ṭabaqátu'l-Aṭibbá*, Vol. I, pp. 310-311.
[5] *Ṭabaqátu'l-Aṭibbá*, Vol. I, p. 253.
[6] P. 167.

cases which he had himself treated.[1] He has described 32 cases and has given full clinical details of every case. In his *Kitábu'l-Fákhir* also al-Rází has mentioned some other cases and has given full details of them.[2] Ibn Sarabiyún also in his *al-Fusúlu'l Muhimma fi Ṭibbi'l-Umma*[3] has devoted the whole of the ninth Chapter to the description of clinical cases and has mentioned 21 cases that were treated by Rufus and other physicians, ancient as well as modern and has described all these cases with full clinical details.

The interest in actual cases and clinical observation naturally changed the attitude of the Arabic medical writers to the authority of the ancient physicians. While the earlier writers accepted their theories as sacred words which could not be questioned, al-Rází in many of his works like *al-Ḥávi* and the *Kitábu'l-Fákhir*, after referring to their views of medical problems gave his own view of them. Some remarks of al-Rází and Ibn Sarabiyún in connection with clinical cases show their tendency towards making experience the basis of medical theories and applying the inductive method to medical investigation. Ibn Sarabiyún says in the introduction of the 9th Chapter of his *Fuṣúl*, to which we have already referred, that on the basis of the cases which he has mentioned (in chapter 9), certain general medical laws may be established. Al-Rází also has made some observation to the same effect in the headings of the Chapter on clinical cases. Hibatu'l-Láh b. Ṣá'id says in his *Aqrábádin* that the properties of medicament with reference to human body, can be known well, only by means of experiment.[4] Ṣá'id b. Bishr revolutionised the method of treatment of paralysis and other similar diseases and instead of treating them with hot medi-

[1] Bodleian Marsh 156 ff. 239 b.—245 a. The first of these cases has been mentioned by Prof. Browne (*Arabian Medicine*, pp. 51-52). Some other cases are given in Appendix (I) of this dissertation.

[2] Browne Or. Ms. p. 2. ff. 341a-b; 342a.

[3] Bodleian Hunt. 461 ff. 37-50.

[4] British Museum or 8294, f. 3a.

caments, as was done by the ancient physicians, treated them with cold medicaments and blood letting.[1]

But the tendency shown by al-Rází and Ibn Sarábiyún, which was full of promise for the future, failed to produce any great revolution in Medical Science. The authority of the ancient Greek physicians ever ruled supreme in Arabic medical literature. As in the *Firdausu'l-Ḥikmat*, the first Arabic medical compendium, so in the much later works we find the same Greek ideas of Physiology as well as of general and special Pathology, only better systematised. The dream of Yúḥannáh b. Māsawayh of a coming time, when nothing would be accepted but on the authority of experience, had never been realised.

[1] *Ṭabaqátu'l-Aṭibbá*, Vol. I. p. 232

APPENDIX (I)

Clinical cases mentioned by al-Ra'zí and others.

Many stories of the treatment of patients by Arabic physicians and others are mentioned by Ibnu'l-Qifṭí, Ibn Abí Uṣaybi'a and others. But these stories being of doubtful character and having no clinical details are of little scientific value. Some clinical cases with full clinical details are mentioned by al-Rází in his *al-Ḥávi* and *Kitábu'l-Fákhir* and by Ibn Sarábiyún in his *al-Fuṣúl-ul-Muhimma*, which are of great importance from our special point of view. They show how these physicians interpreted the symptoms of diseases according to their theories of the healing art, how they applied their theories to particular cases and lastly how these cases influenced their theories. We have therefore given in this appendix some cases which are taken from these Arabic Medical works. The last of these cases which is taken from *Tárikhu'l Ḥukamá* of Ibnu'l-Qifṭí is added only on account of its specially interesting character, though its genuineness is doubtful.

Cases from al-Fuṣulu'l-Muhimmat fi Ṭibbil-Ummat Bodleian Hunt, 461. Chap. 9.

(1) I saw a man suffering from melancholia on account of spleen-disease. There was no inflammation worth any consideration but the man thought that he suffered from it and felt an imaginary sensation of the creeping of an ant in his spleen. He was thirty years old and had previously suffered from bowel-complaint which was due to vicious humour that had caused constipation. He felt the call of nature at the interval of three or four days. For this he either took a purgative or some clyster by means of a syringe. Whenever he took any of these, he passed some stony substances or thick matters from his bowels. If he failed to take any purgative he suffered from colic and asked me for such medicines as would move his bowels. I gave him *scilla* dipped in honey as is given to epileptics because the laxatives which he had used many a time did not do him any good. This, however, he took once every day. When he found it useful for counteracting viscosity of phlegm, he began to take it two or three times a day. Having used it for about a year he complained to me of some pain in his spleen. I examined it and did not find any inflammation and asked him to give up the juice of *Scilla*, and take instead of it, once, kernels of bastard saffrons seeds with fig and once

decoction[1] with beet, cabbage, and lentils. He did so, but the pain increased. Then, thinking that some acute humour was produced by the medicine, I gave him a big dose of epithym with polipodium and a little scammony, because otherwise his bowels would not respond well; so I made it strong. After some trouble, however, his bowels were a little loosened. Then I asked him to take light food with epithym. He was subsequentiy attacked by fever in the evening and by melancholia from the next morning, because he had given up the use of epithym. On the 2nd day I opened his vein because on the first day, on account of fever and insomnia his food was not digested. I also used some paregorics as ointment on his spleen and the rest of the belly. He used to complain of burning sensation, after the fits of melancholia were over but when I opened the vein of the left ankle-bone and evacuated sufficient quantity of blood this complaint partly subsided, and when I repeated bleeding on the 2nd day the fever subsided and the burning sensation and the symptoms of melancholia were very much reduced. I evacuated the blood twice on the 2nd day, because the patient was strong and his blood was inflamed. From the next day I gave him whey (for diet) because I was afraid of the heat which is produced by epithym, in the stomach and the sides. I also syringed him with hot clysters and cooled his spleen. On the 3rd day I mixed a little scammony with the milk (whey). After taking it for a week the patient was completely cured. (f. 39 a-b.).

(2) I knew another man who suffered from melancholia on account of pleurisy without fever, or on account of painful breathing accompanied by a pricking sensation, without any apparent heat in the part affected. For this he used to have his blood let and take purgative every year. So he suffered from the disease between the autumnal equinox and the height of the heat of spring season, because then the disease used to subside on account of bleeding and use of purgatives. When he thought that this treatment did not do him any good he gave it up and so the disease relapsed. I imposed upon him rest for about a month (فوضعت عليه الوضع) and the pain ascended from the sides towards the breast. Then he had some blood let and took some purgatives. The pain did not subside but turned towards the face. He felt it only in one side of the face the jaw-bone of which was affected (فلبث في فكه مک). When I feared that it might pass towards his eye and brain and kill him, I asked him to get his blood let and take purgative three times. I also cauterised the diseased part of his ribs. Thus the pain was completely cured. Nothing strange happened for four days. On the fifth day he began to see images before

[1] Here some words are left out in the manuscript.

his eyes, I could not evacuate matters any more (فلم اجترئ على الاستفراغ) because the patient was much reduced. I, therefore, cauterised when evacuation was needed. It came off very well, and the imagination was soothed down in two days. On the third day appeared the symptoms of melancholia, and all hopes about the patient's cure were given up; but I was not frightened by these symptoms because I was sure that I had checked the matter. I gave him for his breakfast the juice of *χόνδρος* and rock-fish and soup made of beans and everything else that might moisten his body. Thus the symptoms of melancholia disappeared and he was completely cured. The kind of melancholia from which this man suffered was sadness and fear of death and therefore I asked him to keep happy and enjoy himself. He was relieved in eighty days. The physicians were astounded at his recovery, as to how the matter was deflected towards a higher part after being evacuated and how was the patient cured without evacuation of matter. I showed them that the patient suffered from an excess of black bile which was confined in some of his arteries. This humour changed and corrupted the blood in the arteries little by little. After matter was evacuated the effect kept persisting, but it was in the declining stage because I had eradicated it. By the time it reached the brain it was quite weakened. It found in the brain, however, dry inflammatory matters which were due to the sadness and insomnia from which the patient had suffered. This having become like dough, was changed into black bile and caused melancholia. When I moistened it and removed the sadness from the patient, he was cured of the disease (ff. 39 b—40 a.).

3rd case.

(3) I know another man with whom melancholia began on account of inflammation of blood. He was a man of leisure and the anxiety and sorrow from which he had suffered were not very great, and were mixed with some joy. The cause (of melancholia) was his constant application to mathematical sciences. He was also a courtier. On account of all this bilious matter gathered in him at the age when it is usually created, *i.e.*, the period of decline. Over and above all this he had an irritable temperament in his youth and when he advanced in age, black bile collected in him. He had his fits mostly at night on account of insomnia, and in the morning. While asleep in the morning he dreamt bad dreams in consequence of lethargy caused by insomnia. He was treated by an inexperienced physician who evacuated the matter many a time, by means of caustic emetic medicines. He neglected to bring about the equilibrium of "complexion" which is the best remedy for such diseases, because it is the disorder of "complexion" that produces such humours (as cause this disease). The

production of such humours is not stopped without the restoration of proper equipoise of "complexion". The inflammation of his (patient's) complexion produced by these medicines, however, caused a greater inflammation in his body, and at last he became mad and gave up eating and drinking and died (f. 40 a.).

4th case.

(4) Another man twenty-two years old, was rescued from drowning. He suffered from melancholia on account of fear caused by it. A physician treated him in the above-mentioned way, *i.e.*, repeated evacuation by means of caustic emetics, and in the end he caused evacuation by means of black hellebore, and he erred. Then another physician treated him by moistening and by feeding and exhileration, and he was rightly guided. The patient was cured. The recovery of this patient was really due to both the physicians, because the first physician evacuated the matter and the second restored the proper complexion (f. 40 b.).

Clinical cases from al-Ḥavī of al-Rāzī

(Bodleian 3 Marsh. 156.)

1st case.

(1) 'Alak the accountant came to me and complained that he suffered from colic pain, but he did not describe it clearly. He was given al-Tamari (a medicine) which produced good effect and he was cured. Afterwards the pain of the bowels relapsed together with constipation. This was followed by dysentery due to bilious humour and he died while he was away from me. You should know, therefore, that sometimes people suffer from great pain in their bowels, on account of bad bile that flows towards their bowels. They suffer from disease that resembles colic and take the above-mentioned medicine. This is followed by an acute form of dysentery. It is specially so in case of those who have the melancholic temperament. Such was the case of 'Alak, the accountant. You should first loosen their bowels with some laxatives and then give them potions and syringe them. I have seen many such cases.

(2) A man came and complained to me of palpitation of the heart. He put my hand on the left side of his breast, and I found the great artery throbbing so violently and beating against the flesh so strongly that it could be seen. He said that he had opened the basilic vein but it did not do him any good and that when he ate hot things he felt some relief. (At first) I was quite perplexed about him, but after the case became quite clear to me, I advised him to take the medicine known as 'Dawau'l-Misk' and guessed that the throbbing of his artery was similar to the breathing

of the asthmatics who in spite of expanding their chest too much, inhale very little air. (f. 240 b.).

(3) The long-bearded Qaṭṭán suffered from chronic pain in his bowels. As a remedy for it he was given a pure and strong potion to drink. When he took it the pain descended towards the navel, his urine was suppressed, his bladder being full. Then some of the 'Máiyun' made him pass his urine by means of a catheter, without my knowledge. He used it repeatedly so that his bladder was reduced to such a condition that he passed his urine involuntarily. In the urine was mixed some white purulent matter, which, I guessed, was the matter that had descended from the stomach and had suppressed the urine in the bladder. Subsequently, however, he suffered from the paralysis of both of his legs. When he sent for me I went to him and found that the physicians were anointing his legs with hot unguents. I had the presentiment that the bladder had suffered and so in sympathy with it were affected the scrotal nerves till the legs, because the nerves are near to and connected with one another. I also thought that the centre of these nerves had inflamed. I, therefore, plastered the loin and gradually the patient was quite cured. (f. 241 a.).

(4) Abu Dá'ud the ass-driver, who was with us in our journey, suffered from Ophthalmia. I asked him to have his blood let, but he refused to do so. He used cupping instead of it and put drops of a medicine which he had with himself in his eye, in excess. I had forbidden him most strictly to do this, but he did not listen to me. On the following day, however, his condition became worse, I feared that the layers of his eye might burst and flow, because on account of the excessive inflammation of the conjunctiva very small portion of the cornea was visible. When his condition became critical, I had his blood let, and evacuated about three Raṭl (36 oz.) of it on two occasions and cleaned his eyes from impurities and sprinkled it with white collyrium. Then his pain subsided and he slept that very day and the next day he was quite cured. (f. 241 a.).

(5) Khálid of Ṭabaristán suffered from a hot disease which was caused by exhaustion. I gave him barley-water and the like, and the disease subsided to some extent. Then he suffered from pain in the region of the flanks and the spermatic vein (العالية). The physicians mistook it for colic and wanted to prescribe digestive medicines, assuming that the barley-water had done him harm, whereas really there had remained in the stomach some hot matter. I felt the diseased part and found that it was hot and hard. I inquired whether he felt any throbbing in that part. "Somewhat violent" he said. I conjectured that there was hot inflammation in that part. I, therefore, opened the axillary vein

and evacuated about two hundred drachms of blood at once. Then I gave him the juice of *solanum miniatum* and of *cichoreum intybus* and kernels of cucumber-seed. Khálid was thus cured, the disease abating the very day when he was bled. My conjecture was that a part of the matter that had caused the disease, had subsided and another part of it had turned towards the flanks, apparently, because it was not evacuated. (f. 241 b.).

(6) The daughter of Ḥusayn b. 'Abdawayh took camel's milk, as was her habit, without my advice. When the milk caused flatulence, she took the medicine known as Dawáu'l Misk, without having let blood or taken any purgative before it. So she suffered from inflammatory fever and there appeared in her, symptoms of small-pox of which she had four attacks. In the early stage of small-pox when she put me in charge of her treatment I took immediate precautions about her eyes and strengthened them by means of collyrium of antimony which was rubbed in rose-water. Thus nothing at all went into her eyes, though there were some very thick matters round about them. The old woman who attended her was surprised at it. I gave her, however, barley-water, and the like as diet, for a long time, but her bowels did not relax, which generally happens after the attack of this disease. There also remained with her some remnants of inflammatory fever. I thought that it was due to the remainder of humour which had not been evacuated, by means of purging, as usual. I could not use any strong purgative because of the weakness (of the patient). Consequently I continued giving her thyme in the morning and barley-water at noon for fifteen days, which caused her two motions every day. Thus there was perfect evacuation and there appeared in the urine complete decoction in forty days, and the patient was completely cured after fifty days. (f. 241 b. et seqq.).

(7) Ibn Idrís, the one-eyed, suffered from the symptoms of worst type of semitertian fever. It was very acute and had become chronic. The physicians used to give him the medicine known as قرص الطباشير (lozenges of sugar of bamboo). I advised him that he should take barley-water after oxymel, defer taking nourishment till the time when the temperature was low and avoid it at the time of fever. I prescribed this special treatment for him which he thought was difficult, but I said that there was no alternative for him. Subsequently he acted according to my advice in my absence. He met me after ten days when he had completely recovered. (f. 242 a-b.).

(8) The wife of Jaduta who was the brother of Haydara suffered from a hot disease. I gave my advice (about her) every day when her urine was brought to me (for examination). One day he came and told me that she had pain and inflammation in her breast. I advised him that

he should not cool it but rub it, and told him that it was the critical turn (الانتقال البحراني) and that this meant that the disease had assuaged. I also told him that if it subsided suddenly without evacuation, the disease would relapse. Subsequently, I think, the matter moved towards the palms and therefore her extremities became cold, and the pain as well as the inflammation abated, and the original disease relapsed. Then I advised him to persevere in fomenting and cooling, and evacuated the matter and she was cured. (f. 242 b.).

(9) The woman who was brought to me by Abú 'Isá the Hashemite the copper-smith, was extremely fat and of very moist temperament. She suffered from paralysis at the time of delivery, and subsequently from epilepsy. There was no ambiguity in her case. The symptoms were quite distinct. I treated her with strong potions which evacuated the phlegm. Then I advised her to make constant use of the medicine known as ترياق الاربعة. After this the apothecary gave her the medicine known as انفردیا (?) and she was completely cured at which I as well as other physicians were surprised. (f. 242 b.).

(10) Al-Barráz (who resided) in Darbu'l-Nafl came to me. He was thin and suffered from epilepsy from his childhood. I conjectured that his disease could not be due to the phlegm and prescribed for him emetics, frequently. Afterwards I gave him such syrup as might evacuate the black bile strongly. Thus he recovered for three months and his neighbours came to thank me. After some time he took some fish and drank too much wine and consequently was attacked by epilepsy that very night. He used the same syrup again, after having taken the emetics, and recovered. This syrup did not do him any harm till the time I left Baghdád. (In my absence) he was purged by means of such syrup as did not do him any good.

(11) I examined the case of a book-binder called Naẓíf, who was suffering from epilepsy. I saw that his neck-veins were full (of blood) and his face was very red and swollen. He was fat, his eyes were red and his body was full of (plethora). I asked the physician in charge to open his saphena vein, but he opened the basilic vein for which I gave him credit. The boy recovered from epilepsy for a year. (242 b. et seqq.).

(12) The wife of al-Qaṣṣár who was the agent of the son of Sa'íd b. 'Abdur-Raḥmán had the symptoms of dropsy. Her case was urgent, so I administered to her ماء الغلافلي for some time and دواء الكرم for some time. Subsequently once while bathing she fell down the washing-tub and passed about twenty Raṭl (240 oz.) of blood from her private part, and was relieved for some time. The malady relapsed so often that I made careful inquiry into her case and diagnosed it rightly. She suffered from the disease of uterus which I treated. She imagined that

she was pregnant and it was not so. You should know and investigate therefore, (such cases) for there is one of the diseases of the uterus which resemble dropsy. (f. 243 a. et seqq.).

(13) Ibnu'l-Ḥasan b. 'Abdawayh used to suffer from the worst and most acute type of nasal catarrh. No other case of catarrh of this type came to my notice. Even a mild attack of it continued with him for a month and sometimes even more. Then it descended towards his breast so that he ejected it while coughing. Then he used to get relief from it in half a day so that no symptom of it was found. Then he would suffer from rheumatism. So you should know that it is the fact, as Galen has said, that the matter is ejected not only through the visible channels but also through the mutual connexion of the membrane of the body. 'For Ibnu'l-Ḥasan used to be cured almost suddenly, and then rheumatism would come on because the excessive humour turned towards his joints. (f. 245 a.).

(14) One of the important men in Baghdad suffered from the disease of the hip-bone. The physician gave him the medicine known as حب المنتن and cress, because his urine was white. This treatment failed. The pain increased and the disease became more acute so much so that the patient could not sit erect. Then the physician syringed him and the pain increased still more. Then he asked for my help. I caused him to vomit several times while his stomach was full, and afterwards plastered his hip-bone with boiled mustard so that it became pustulated, and the pain decreased and the patient had much relief. Then I syringed him with strong purgatives and he was cured. (f. 245).

(15) The sister of al-Warráq suffered from disease of the hip-bone. I prescribed a clyster, but she asked for some purgative and I advised her to syringe with fish-water. She acted accordingly. Thus after I had cleansed her bowels she was cured. Similar was the case with Ibn Dahl. He did not use any clyster. He used to limp from his hip-bone. He took colocynth for a long time and was cured. (f. 245 a-b.).

31 case.

The case treated by al-Kindi

(1) One of the neighbours of al-Kindí was a great merchant having large trade. He had a son who managed for him all the business of buying and selling and the account of his income and expenditure. Now, that merchant was very fond of vituperating and slandering al-Kindí and was always annoying and provoking him.

L. 12. p. 376.

It so happened that his son had a sudden attack of apoplexy. The merchant was not only anxious about his son, but was also perplexed

about his business because he did not know what people owed to him, and what he owed them. He went to every physician in Baghdád and brought him to his house to see his son and treat him. Most of these physicians did not come to see the patient because of the seriousness of the disease and of its dangerous character. Those who took up the case did not prove of much help. Then some one said to him " your neighbour is the best philosopher of the time and knows best the treatment of this disease. If you go to him you would certainly get what you want." Thus he was compelled by necessity to go to al-Kindí with one of his relations and earnestly urged him to visit his son. Al-Kindí consented and went to the house of the merchant. After examining the patient and feeling his pulse he ordered his students of music, who had acquired skill in playing upon the lute and knew such tunes as cause sorrow or joy and strengthen the hearts and souls (of the hearers) to be called. There came to him four such students. He showed them where to put their fingers on the instrument so as to produce the proper notes and how to vary the notes, and asked them to go on playing the tune which he had taught them. So they began to play and al-Kindí put his finger on the pulse of the patient, who meanwhile took long breaths; gradually his pulse grew stronger and his breath returned; so much so that he moved his limbs and then sat down and talked. The musicians went on playing the same tune and did not stop. Then al-Kindí asked the merchant to inquire from his son all that he wanted to know about his debit and credit, and to put it down. So the man inquired from him (son) and he replied and he (merchant) put down everything one after another. When he had learnt all that he wanted, the musicians neglected the tune that they were playing and stopped and the patient returned to his previous condition and was (again) struck with apoplexy.

The merchant requested al-Kindí to ask his students to play the same tune again, but he expressed his regret and said that now only the last dregs of his life remained and that in that brief space it would be impossible to repeat what had already been done and that neither he nor anybody else had the power to add to the life of a man who had completed it, since he had now exhausted the supply of life that had been given to him by God. (*Tárikhu'l-Hukamá* p. 376).

APPENDIX 2.

MEDICAMENTS.

In this appendix, an attempt has been made to identify the plants and other medicaments used by Arab physicians. The only way in which it could be done, was to determine, exactly, what plants and medicaments of early Greek physicians are denoted by the Arabic terms. The best guide for this purpose is the '*Mufradát* of Ibnu'l-Bayṭár who knew Greek well. He quotes Dioscurides, and refers to the parts and chapters of his book, in connection with almost every medicament. We have compared these quotations in every case with the German translation of Dioscurides by J. Berendes, and thus have tried to establish the identity of the Arabian medicaments with those of the early Greeks. The main source for the Latin and English equivalents is the '*Terminologie Medico-Pharmaceutique*' *of Schlimmer*' (Ṭehrán, 1874).

The following abbreviations are made use of:—

D = Dioscorides. (German trans.: by J. Berendes Stuttgart, 1902).
I.B. = Ibnu'l-Bayṭár. (Mufradát. Cairo).
Gr. = Greek.
P = Persian.

الآس al-Ás (Löw p. 50), Gr. Μυρσίνη (D. 1. 155); Myrtle.

الآس البري al-Ásu' l-barri, Gr. Μυρσίνη ἀγρία (D. 4. 144),—Bamboo Cane. It is also known as قف و انظر and خيزران (I. B. Vol. 1. p. 30).

الآسارون al-Ásárún, Gr. ἄσαρον (D. 1. 9.),—Asarum.

الآملج al-Ámlaj, P. آمله —Phylanthus embelica.

الابار al-Ibár—Black lead, some people think that it is burnt lead (lead oxide, I. B. 1, p. 9).

الابهل al-Abhul, Gr. βράθυ (D. 1. 104),—Juniperus Sabina. Avicenna identifies this plant with شجرة العرعر (*Canon*, Vol. 1. p. 248), but Ibnu'l-Bayṭár points out that this is a mistake (I. B. v. 1. P. 6). شجرة الله which is commonly known as دیودار devdár, is a species of this plant (I. B. Vol. 2. p. 120).

الأثاناسيا al-Athánásiá, Gr. ἀθανασία, meaning immortality is a medicinal compound, which is of two kinds: one is called اثاناسيا صغرى and the other اثاناسيا كبرى (*Canon*, Vol. 3. p. 330).

الأثل al. Athul, Gr. Μυρίκη (D. 1. 116),—Tamarisk. Ibnu'l-Bayṭár says that it is one of the four species of al-Tarfá (الطرفا).

الاثمد al. Ithmid,—Antimony.

الاديانطون al. Adiánton, Gr. ἀδίαντον (D, 4. 134),—Adianthum. See پرسیاوشان.

الاذخر al. Adhkhar, also called جورجيا Per. گورگیاه and كاه مكي (D. 1. 16)—*Andropogon Schoenanthus*.

الأذريون al-Adhariyyún, P. آذرگون (löw p. 41)—Calendula.

اذن الفار Udhun'l-Fár—Gr. Μυος ὠτα (I. B. 1. 16; D. 2. 214)—Parietaria officinalis. Ibnu'l-Bayṭár has mentioned four species of this plant (Vol. 1. pp. 16-17).

اذن الحمل Udhnu'l-Ḥamal, also called اريخسون, a species of لسان الحمل, which is mentioned by Dioscorides as (D. 2. 152),—Arnoglossum. It is also known as ذنب الفارة, اذن الجدي and كثير الاضلاع (I. B. Vol. 1. p. 18; Vol. 2. p. 126; Vol. 4. pp. 53, 107).

الأرز al-Uruz,—Gr. ὄρυζα—Rice.

الايرسا al-Irsa, Gr. ἶρις (D. 1. 1.)—Iris. al-Ṭabarí says that it is the root of the blue lily, but Innu'l-Bayṭár says that it is the blue lily (I. B. Vol. 1. p. 71).

الاسطوخودوس al-Ustúkhúdús, Gr. στοιχαδος—Lavender.

الاسفاناخ al-Isfánákh, P. اسپاناخ from سپنج or سه پنج Spinach.

الاسفيداج al-Isfídáj—P. سپيده abr. of اسفيداج الرصاص Gr. ψιμυθιον (D. 5. 103)—a particular preparation of lead-powder. (Ibnu'l-Bayṭár Vol. 1. p. 31).

الاسفيدباج al-Isfídbáj, a kind of food. It is prepared in the following way: Put two pounds of camel-meat in a pot and pour one ounce of شيرج (Coriander oil), add a little salt and a handful of bruised common peas and two ounces of small pieces of onion; pour so much water in the pot as may cover the meat, and cook it on moderate fire. When ready put into it a little salt, onion, coriander and rose water. (Uri Arab. Moh. DXLI f. 20. b.).

الاسقيل al-Isqíl, also spelled with ش Gr. Σκιλλα (D. 2. 202)—Scilla. It is also called منصل (I. B. Vol. 3. p. 138), and بصل الفار because it kills the mice (*Canon* Vol. 1. p. 346).

اسقردیون al-Asqardiyyún, spelled by Ibnu'l-Bayṭár as شقردیون Gr. Σκορδιον (D. 3. 115)—*Scordium*. It is also called ثوم بري, حافظ الاجساد and حافظ الموتى. Some people have confused it with ثوم العيّـه which is quite a different drug (I. B. 1. 153).

الاشـترغاز al-Ushtargház P. meaning شوك الجمـال or Camel-thorn, Gr. Μαγύδαρις (D. 3. 84 last Para)—Magudaris root. Al-Ṭabarí says that it is Silphion-root (اصل الانجدان), but it appears from the *Mufradát* of Ibnu'l-Bayṭár that it is a different plant which resembles silphion in appearance and properties (I. B. Vol. 1. p. 35). It is also called زنجبـيل العجم (I. B. Vol. 2. P. 168).

الاشنـة al-Ushna, commonly known as شيـبة العجوز (I. B. 1. 36) Gr. βρύον (D. 1. 20)—*Lichen odoriferum*.

الاصطرك al-Istirak Gr. Στύραξ (D. 1. 79), also spelled with س — styrax.

الاطريه al-Aṭriya—a kind of food known in Persia as برشته. It is prepared by cooking pancakes with water, with or without meat. (*Canon* Vol. 1. p. 264).

الطريفل al-Ṭerífal—an electuary which has for its main ingredients black and chebule myrabolan. There are two kinds of it; one is known as الطريفل الصغير and the other as الطريفل الكبـير.

الاغاريقون al-Aghâríqún, Gr. αγαρικον (D. 3. 1.)—Agaric.

الافتيمون al-Aftímún Gr. επιθυμον (D. 4. 176)—Epithyme.

الافاويه al-Afávia see قوة.

الافربيون al-Afrabiyyún Gr. ευφορβιον (D. 3. 86)—Gum Euphorbium. It is also called فربيون, فوفيون and لبانةغربية. (I. B. Vol. 3. p. 158; *Canon* Vol, 1. p. 108).

الافيون al-Afyún, Gr. οπιον[vi] —opium.

الاقاقيـا al-Aqáqiá, Gr. ακακια (D. I. 33), commonly known as الصمغ العربى which is generally meant when the word صمغ is used without any qualification—Acacia.

الاقليميا al-Aqlímiá Gr. κιμωλια γη (D. 5. 175) also called قديميا Gr. καμια —scorio, furigo aeris.

الاكتمكت al-Akitmakit—an Indian drug which possesses the properties of Orpine (*Canon*, Vol. I. p. 262). Ibn Jezla says that some people says that it is الطموط, Nikestree (Uri. DXLI. f. 24). Ibnu'l-Bayṭár says that it is a stone which is also called حجر الولادة and حجرة العقاب (I. B. Vol. VI p. 151).

البادرنجبويه al-Bádranjbúya, p. بادرنگ بويه meaning "smelling like orange" also called البقلة الاترجية and حبق ريحاني (I. B. vol. 1. p. 73) Gr. Μελισσοφυλλον (D. 3. 108)—*Melissa Cedronella.*

البادروج al-Bádrúj P. بادروک —Basil. It is also known as حوک and ريحان (I. B. vol. 1. p. 79). ωκιμον

البادنجان al-Badanján P. بادنگان —Brinjal. It is also called الانب, المغد and الوغد (I. B. vol. 1. p. 80. vol. 4. p. 193).

البان al-Bán—Ben—nut. Gr. βαλανος μυρεψικη

البابونج al-Bábúnaj, P. بابونه also called حبق البقر and تفاح الأرض (I. B. vol. 1. p. 139; vol. 2. p. 6)—*Camomile.*

البارزد al-Bárzad P. برزد, commonly known as القنه (I. B. vol. 1. p. 83) Gr. Χαλβανη (D. 3. 87),—*Galbanum.*

الباسليقون al-Básaliqún Gr. βασιλικόν,—Basilikon.

البادآورد al-Bádáward also called شوكة بيضاء, Gr. ἄκανθα λευκη (D. 3. 12),—Cardunus benedictus. see شكاعي

بخورمريم Bukhúri Maryam, also known as فنجكشت p. پنج انگشت Cyclamen. It has been generally identified with شجرة مريم and شجرة ابراهيم but Ibnu'l-Bayṭár differentiates between the two and says that شجرة مريم is a general term which is applied to اقحوان, Feverfew, and a few other plants, whereas فنجكشت and بخورمريم are applied only to Cyclamen, (I. B. vol. 3. p. 55).

بزرقطونا Bazrqaṭúná also called برغوثي from برغوث (D. 3. 130),—Fleawort.

اكليل الملك Iklílu'l-Malik, P. گياه قيصري Gr. Μελίλωτος (D. 3. 41)—Melilot.

الأمروسيا al Amrúsia, Gr. αμβροσια (D. 3. 119)—Ambrosia.

الامبرباريس al-Amírbáris, also called بربارس and زرشک جبلی Barberry.

الأنزروت al-Anzarút, also spelled with ع. Penaea Mucronata.

الأنجرة al-Anjara, also called قريص and نبات النار Gr. ἀκαλύφη (D. 4. 92)—Nettle.

الأنكسا al-Ankusá, Gr. ἄγχουσα (D. 4. 23)—Anchusa It is also called شنجار and رجل الحمام etc. (I. B. 3. p. 69).

الأنيسون al-Anísún, Gr. ἄνισον (D. 3. 58),—Anise.

الإصطاخيقون al-Istamákhíqún pl. اصطاخيقونات G. στομαχικόν, a kind of purgative.

الأيارج al-Ayárij Gr. ἱερᾶ Avicenna says that the word means the divine medicine (الدواء الالهي) .

الايارج الفيقرا al-Ayárju'l-fay-Qrá Gr. ἱερὰ πικρά, —a compound purgative.

البرنجاسب al-Beranjásb, also spelled with ف P. برنجاسپ and پلنگ اسپ Arabic حبق الراعي . مسك الجن and مشويه Gr. ἀρτεμισία (D. 3. 117),—Artemisia, Vulgaris. Al-Ṭabarí identifies it with قيصوم Gr. ἄβροτον ; (D. 326), and Schlimmer gives, as equivalent of the latter, Artemisia Abrotanum. It is more probable that they are two species of the same genus of plants.

برسياوشان Bersiáushán, P. پرسياوشان also known as شعر الجبار Adiantam capillus Veneris. See also الأديانطون .

البردي al-Bardí, also called فاپير —Papir.

البسباسه al-Bisbasa, Gr. μάκερ (D. 1. 111), Macis.

البرباريس al-Berbáris—see اميرباريس .

البسّد al-Bussad also called اصول المرجان —Coral.

البسفائج al-Bisfái'j, P. بسپايه , بست پايه , also called كثير الارجل Gr. πολυπόδιον (D. 4. 185),—Polypodium Vulgare. It is also known as اضراس الكلب and ثاقب الحجر (I. B. vol. 1. pp. 39; 149).

البطم el-Batum,—Terebinth. The fruit of this plant is known as سبزدانه , Arabic الحبة الخضراء (I. B. vol. 2. p. 5).

بقلة الحمقا Baqlatu'l-Ḥamqá, Gr. ἀνδράχνη (D. 2. 150),—Purslain. It is also called البقلة المباركة , البقلة اللينة and رجله (I. B. vol. 1. p. 102).

البقلة اليمانيه al-Baqlatu'l-yamániyya, Gr. βλητον (D. 2. 143), Blitum. It is also called البقلة العربيه (I. B. vol. 1. p. 103).

البلوط al-Ballút—Oak.

البلاذر al-Baládhur,—Anacordii longifolii semen.

البلبس al-Bulbus, Gr. βολβός (D. 2. 200).

البلسان al-Balsán, Gr. βλσαμον (D. 1. 18),—Balm.

البليلج al-Balaylaj,—Belleric Myrabolan.

البنج al-Banj, P. بنگ —Indian Hemp. It is also called خادعة الرجال because the Assassins (al-Ḥashíshíyyún) used to give it, or the food containing it, to their victims in order to gain an advantage over them.

البندق al-Bunduq, Pr. Arabic فندق Gr. κάρυον ποντικόν (D. 1. 179)—Hazel nut. Ibnu'l-Bayṭár says that Abu Ḥanífa has said that it is the same fruit which was known by the Arabs as جلوز (I. B. vol. 1. p. 125).

A. Arabian pharmacy at work—preparation of 'Theriac' (antidote).

B. Preparation of Linctus.

From Vienna National Library's Ms. of the Arabic translation of Galen's Materia Medica A. F. 10 (427) fols. 28 b and 30 b.

It is, however, different from بندق هندي, which has been identified by Schlimmer with Caesalpinia Bonducella.

البورق al-Búraq, Borax. Many kinds of it, including نطرون Gr. νίτρον are mentioned by Ibnu'l-Bayṭár (vol. 1. p. 125).

البومس al-Búmus. No plant of this name has been mentioned by Ibnu'l-Bayṭár and Avicenna. Dioscorides has mentioned one plant named βρώμος which, he says, is used for the bad smell of the mouth (D. 4. 138), and this statement agrees with the short description of the plant given in the marginal note of the British Museum copy of the *Firdausu'l Ḥikmat*, viz. it is a sweet-smelling plant (نبات عطرية).

البهرمان al-Bahramán, also called بهرام and عصفر (I. B. vo. 3. p. 125), yellow dye.

التربد al-Turbud, also known as شجرة الذرارح because flies live in it,—Terbeth. Some people have confused it with آلوبن Gr. ἄλυπον (D. 4. 176), and طريفوليون Gr. τριπόλιον (D. 4. 133), but they are wrong (I. B. vol. 1. p. 53., vol. 3. p. 102).

الترمس al-Tirmús, also written as ترمس Gr. θέρμος (D. 2. 132), Lupinus Albus.

الترياق al-Tiryáq Gr. θηριακή —Theriac. The medicinal compound known as theriac was first prescribed by Aesculapius. (Ibn Abí Uṣaybi'a vol. 1 p. 23).

الترياق الاكبر al-Tiryáqu'l-Akbar, a medicinal compound.

الترسم al-Tursum, a medicinal compound used as a purgative.

التلخشقوق al-Talkhashqúq, also spelled as طلخشقوق and طرخشقوق commonly known as الهندباء البري (I. B. vol. 3. p. 102) Gr. σέρις (D. 2. 159),—Wild succory. Al-Ṭabarí says that it is الخس البري wild lettuce lactica.

الجاوشير al-Jáweshír P. گاوشير Gr. παιανίς (D. 2. 48),—Opoponax.

الجاورس al-Jáwars, P. گاورس Gr. κέγχρος (D. 2. 119),—Common Millet.

الجدوار al-Jadwár, P. زردوار and زدوار .—Zedoury. It is also known as انشله .

الجرجير al-Jirjír, Gr. ἐρύσιμον (D. 2. 169),—Rocket.

الجشميزق al-Jashmízaq, P. گشميزج —Fructus Tamaricis orientalis.

الجفت Aljuft. Acorn cup.

الجلنار al-Julnár, P. گل انار, Gr. βαλαύστιον (D. 1. 154),—Blaustines.

الجلا al-Jalauz see البندق .

الجندبيدستر al-Jundbedaster, P. گندبيدستر also called حضيـة البحر and فاحشه Gr. κόστορος ὄρχις (D. 2. 26),—Castoreum.

الجنطيانا al-J ntiánà, Gr. γεντιάνη (D. 3. 3),—Gentian. It is so called because a king named Gentis had first discovered it (I. B. vol. 1. p. 170).

الجوز al-Jauz, P. گوز Walnut. It is known by the botanist as حب اهل الحجازمة .

جوزجنـدم Jauz Jandam, P. گوز گنـدم also known خرء الحمام and شحم الارض (I. B. vol. 1. p. 128).

جوزبويا Jauzbúyá, P. گوزبويا also known as جوز الطيب Nux Muschata. Schlimmer has wrongly identified it with جوز مندي which according to Ibnu'l-Bayṭár, is نارجيل cocoanut.

جوز القى Jauzu'l-qay—*Nux vomica*.

الجري al-Jerrí, Gr. σίλουρος. (D. 2. 29)—A kind of fish which is found in the Nile,—Eel.

الجمسفـرم al-Jamsafram, P. meaning ريحان سليمان (I. B. vol. 1. p. 168),—Baselic.

الحاشا al-Ḥáshá, Arabic حاشـه Gr. θύμος (D. 3. 38), Thyme. It is also called صعتر الحمير .

حبّة الخضـرى Ḥabbatu'l-Khaḍrá P. سبـزدانه also called حب البنـه Persian Turpentine seed. see البطم .

حبّ الملوك Ḥabbu'l-Muluk, also called حبّ السلاطين commonly known as ماهودانه Gr. λαθυρίς. (D. 4. 164), *Croton-Siglium*. Ibnu'l-Bayṭár says that the word حب الملوك is an biguous and is used for different drugs (vol. 2. p. 15).

الحبـق النـهرى al-Ḥabaqu'l-Nahri, commonly known as نعـنع also called حبق المـاء because it grows on the banks of rivers, and فودنج p. پودنه, Water-mint.

الحرف al-Ḥurf, also called حب الرشاد Gr. κάρδαμον (D. 2. 184),—Nasturtium. It is also called مقليا . Some physicians hold that it is called مقليا, only when it is fried (I. B. vol. 4. p. 163).

الحسك al-Ḥasak, also called اضراس العجوز Gr. τρίβολος (D. 4. 15)—Star thistle.

الحصرم al-Ḥisrim. Verjuice, hence حصـرميـه soup prepared with unripe grapes or dates or with its juice.

الحرمل al-Ḥarmal,—Harmala Ruta. Ibnu'l-Bayṭár has mentioned two kinds of it: white, which is known as حرمل عربي and is called in

Gr. μῶλυ (D. 3. 47), and red, which is known as حرمل عامي Gr. πήγανον ἄγριον (D. 3, 46, I. B. vol. 2. 14).

الحضض al-Ḥuḍuḍ, also called خولان Gr. λύκιον (D. 1. 132),—Lycium, see also فيلزهرج.

الحلبة al-Ḥulba, Gr. τῆλις (D. 2. 124),—Erigonella Foenum Graecum.

الحلياسا al-Ḥalyáṣá,—Erisymum.

الحماما al-Ḥamámá, Gr. ἄμωμον (D. 1. 14), Amomum.

الحماض al-Hummáḍ, Gr. λάπαθον (D. 2. 140),—Oxalis Acetocella.

• الحنا al-Ḥenná,—Lawsonia Inermis. The flower and seeds of this plant are known as فاغية الحنا.

الحندقوق al-Ḥandaqúq, also called الحندقوقى and الحندقونا Lotus.

حيّ العالم Ḥayyu'l-'Ālam, Gr. ἀειζωον (D. 4. 88), Sempervivum. Dioscorides says that it is so named because its leaves never fade. The Arabic name of the plant, as well as the Persian همیشبهار or میشبهار bear the same meaning as the Greek one. Ibn Abi Uṣaybi'a explains this differently from Dioscorides. Describing how Zakeriya Rází took up the study of medical science, Ibn Abí Uṣaybi'a says that once, one of the childeren of Aesculapius was attacked by a hot swelling of an arm and was taken to the bank of a river where this plant was growing. The child put his hand on the plant by chance, and felt some relief; he did so repeatedly, and in course of two days he was perfectly cured. Thus on account of its miraculous effect, the plant was called حياة العالم or "the life of the world", which on account of common use was shortened into حيّ العالم (Ibn Abí Uṣaybi'a, vol. 1. p. 309).

الخرنوب al-Khurnúb,—Ceratonia.

الخربق al-Kharbaq, Gr. ἑλλέβορος (D. 4. 148),—Helleborus. There are two kinds of it: white and black (I. B. vol. 2. p. 51).

خزرة اليرقان Khazratu'l-Yarqán. Al-Ṭabarí says that it is a food made of minced meat and flour, which is so called because it has a pale colour.

الخس al-Khas, Gr. θρίδαξ (D. 2. 164),—Lettuce.

الخسرو دارو al-Khusraudárú, commonly known as خولنجان (Bodleian Marsh, 246 f. 75 b.)—Galanga.

خصية الثعلب Khusyatu'l-Tha'lab, Gr. σάτυριον (D. 3. 133),—Satyrion. Ibnu'l-Bayṭár says that the خصية الثعلب of the Andalusians is quite different from the satyrion of Dioscorides (vol. 2. p. 64).

الخطمى al-Khiṭmí,—Althaea officinalis.

الخلاف al-Khiláf,—Willow. There are many species of it; صفصاف is one of them (I. B. vol. 2. p. 68). Some people have identified it with سطوبي, στοιβη of Dioscorides (4. 12), but this is an error (I. B. vol. 3. p. 14).

الخوخ al-Khaukh, also called دراقن,—The Peach.

الخيري al-Khayrí, also called عصيفرة and منثورة Gr. Λευκόϊον (D. 3. 128).—Gilliflower.

الخيار شنبر al-Kheyárshamber, P. خيار چنبر, also called قثاء هندي and خرنوب هندي —Cassia Fistula.

الدار شيشعان al-Darshísha'án, Gr. ἀσπάλαθος (D. 1. 19),—Aspalathus.

الدفلى al-Diflá, also called سم العصار P. خرزهره, Gr. νήριον (D. 4. 82).—Nerium.

الدوقوا al-Dúquá. The word was originally derived from Gr. δαῦκος (D. 3. 76), but it has been used by the Arabs for wild Carrot, الجزر البرى (I. B. 2. p. 120., *Canon* vol. 1. p. 294).

دم الأخوين Dam'l-Akhwayn, also called دم الثعبان and دم التنين P. خون سياوشان *σάνδαρις*; (D. 4. 33), Dragon's blood, *Sanguis Draconis*.

دهن الرازقى Duhnul-Ráziqí. The identification of this oil is difficult, because the authorities differ about its identity. Avicenna, and 'Alí 'Abbás do not mention it. Ibnu'l-Bayṭár quotes and supports the statement of Aminu'l-Daulat that it is lily-oil (I. B. vol. 2. p. 135). Al-Ustadhu'l-Mahir says that some people think that it is oil of *zambaq*, a kind of flower which has long leaves, and resembles نيلوفر, Lotus, and has in the centre ball-pointed needless of yellow colour. It is white, and has a strong smell. Some physicians think that many people mean Jassamine when they write دهن الرازقي. It is really the oil of long grapes which is found in abundance in Andalusia.

الرازيانج al-Ráziyánaj, also called برمليا, شمار and بسباس Gr. μάραθρον (D. 3. 74),—Anethum foeniculum.

الراتينج al-Rátínaj,—Colophany. Avicenna says that it is the gum of the pine tree (*Canon*. vol. 1. p. 430). Ibnu'l-Bayṭár says the word has been generally misunderstood, and misused for resin in general. Honayn has rightly used it for colophany (I. B. vol. 2. p. 135).

الراوند الصيني al-Ráwandus-Ṣínf, also known as رقوية يمانية Gr. ῥᾶ — Rhubarb. Ibnu'l-Bayṭár in his long article on al-Ráwand, quotes Ibni Jámi' who says that in his time the word was used for four different kinds of rhubarb, Chinese, Abyssinian, Persian and Turkish, whereas by the ancients it was used only for the first two kinds (I. B. vol. 2. p. 130).

الراسن al-Rásan, also known as قسط شامي and زنجبيل العجم Gr. ἑλενον (D. 1. 27),—Enula helenium.

الرامك al-Rámak, also called كزب P. كسپه.

الرب al-Rub, Rob. The difference between a Rub and a syrup is this that a Rub is simply an inspissated juice, and a syrup is juice boiled down and thickened with sugar (*Canon* Cairo. vol. 3. p. 363).

الرطبه al-Raṭba,—Trifolium Alexandrinum. Ibnu'l-Bayṭár, says that it is called الرطبة when it is fresh and القت when it gets dried. It is also called قضقصه p. اسفست.

• الرصاص al-Raṣáṣ, Lead. Ibnu'l-Bayṭár quotes Ghafeqi who says that الرصاص is the white lead which is also known as القصدير while the black lead is called اسرب (vol. 2. p. 140). see also اپار.

الزاج al-Záj, p. زاك,—vitriol. Al-Ṭabarí says that there are many kinds of it, but he mentions only four kinds: شب يماني Alum, القلقطار yellow vitriol, السوري red vitriol, القلقديس white vitriol, and says that they can be transformed into one another. Al-Rází in his Kitábu Sirri'l-Asrár adds الزاج الأسود, black vitriol, to the above list, and mentions the method of their preparation and transformation into one another. (Göttingen Arab. 95. f. 2. b.).

زاج الأساكفه Záj'-l Asákifa, Gr. μελαντηρία (I. B. vol. 2. p. 148. D. 5. 117).

زبد البحر Zubdu'l-Baḥr, Gr. ηλκυόνιον (D. 5. 135),—Cuttle-fish-bone.

الزراوند al-Zaráwand, Gr. ἀριστολοχία (D. 3. 4.),—Birthwort. There are two kinds of it: طويل and مدحرج, or long and round.

الزرنباد al-Zarunbád,—Zerumbeth.

الزرنيخ al-Zarníkh. Gr. ἀρσενικόν (D. 5. 120.)—Arsenic. Al-Ṭabarí says that there are two kinds of it, white and red, but Ibnu'l-Bayṭár says that there are many kinds, such as yellow, gray, etc. (v. 2. p. 160).

الزعرور al-Za'rúr, Gr. μέσπιλον (D. 1. 169), also known as ذوثلاث حبّات meaning "having three grains," Gr. τρίκοκος (D. 1. 169),—Azarole or three-grained medlar.

الزفت al-Zeft,—Pix Nigra. Al-Ṭabarí says that there are two kinds of it, namely dry and moist, and it is from the latter one that *Tar* is prepared.

الزنجبيل al-Zanjbíl, P. زنجبر Gr. ζιγγιβερις (D. 2. 189), ginger.

الزوفا الرطب al-Zúfa'l-Raṭab, Gr. ὄσυπος (D. 2. 84),—*Nepta Orientalis*.

الزوفا اليابس al-Zúfa-l-yábis, Gr. ὕσσωπος (D. 3. 27),—Hyssop.

الزوفرا al-Zúfrá also known as حرا and دينارويه Gr. πανακές ἡρακλήιος (D. 3. 49.).

الزيرباجه al-Zerbája. A kind of food prepared from meat, peas, vinegar, and almonds. These are different kinds of it, الكنجينه being the best. The method of its preparation is given by Ibn Jezla (Bodleian Marsh, 241. f. 97. a.).

الساذج الهندي al-Sádhaju'l-Hindí, Gr. μαλαβάθρον (D. 1. 11.),—Malabathrum.

السبستان al-Sabistán, P. سپستان from سگ پستان Sebestan. It is also called المخيطا and الدبق (I. B. vol. 3. p. 4.).

السداب al-Sudáb, also called فيجن Gr. πήγανον (D. 3. 45.),—Common Rue.

السدر al-Sidr,—Leaves of Lotus, for the difference between السدر and النبق see Ibnu'l-Bayṭár vol. 3. p. 4.

السرمق al-Surmaq, P. سرمک also called قطف Gr. ἀτράφαξις (D. 2. 145),—Atriplex.

السرطان البحرى al-Sarṭánu'l-Baḥrí, sea-crab. Avicenna says that when the physicians speak of it they do not mean any sea-crab, but a particular species of it. (*Canon*, vol. 1. p. 381). Ḥonayn in his translation of Galen has used it for Sepia, which is a kind of fish (I. B. vol. 3. p. 10').

السساليوس al-Sesáliūs, Gr. σέσελι (D. 3. 53, 54), Seseli.

السعتر al-Sa'tar, see الصعتر.

السقمونيا al-Saqmúniá, Gr. σκαμμωνια (D. 4. 168),—Scammony.

السكبينج al-Sakbínaj, Gr. σαγαπήνον.—Sagapenum.

السكباج al-Sakbáj.—A kind of food which is prepared in the following way. Small pieces of meat should be boiled and then left for some time so that they may get dried; and some onions, and carrots, should be boiled and then washed in cold water, and then boiled again with spices and some vegetables; then the meat together with some sugar, or honey or both, should be put into it and cooked on a very moderate fire. Some Saffron also should be added to it (Bodleian, Marsh 241. f. 102.

السلق al-Silq, Gr. τευτλον (D. 1. 149). Beet.

السليخه al-Salíkha, Gr. κασσια (D. 1. 12),—*Lauri cassiae cortex.*

السماق al-Sumáq, Gr. ῥοῦς. (D. 1. 147), Sumach. It is also called سماقيل and سماق الدبّاغين because it is used in tanning (I. B. 2. 29).

السماقيه al-Sumáqiya. A kind of food in which the juice of Sumach is put. For its preparation see Bodleian, Marsh, 281, f. 97. a.

السنبل al-Sumbul, Gr. νάρδος. (D. 1. 6),—Hyacinth. There are two kinds of it: Indian and Syrian; the former is also known as سنبل الطيب and سنبل العصافير.

السندروس al-Sandrús,—Sandrach.

السنجفر al-Sinjfar, also called زنجفر Gr. κινναβαρι (D. 5. 109),—Cinnaber. Ibn Juljul as quoted by Ibnu'l-Bayṭár mentions two kinds of it, natural and artificial, (I. B. vol. 2. p. 17). Al-Ṭabarí mentions only the artificial kind and says that it is prepared from burut powder of lead. It seems, however, that السنجفر of al-Ṭabarí is different from that of Ibnu'l-Bayṭár because the latter says that the artificial kind is prepared from sulphur and mercury. See *Notices et Extraits de Manuscrits* No. 1132 ft. note.

السوس al-Sús, Gr. γλυκύρριζα (D. 3. 5.)—Liquorice. Al-Ṭabarí has confused it with سوسن, lily.

السورنجان al-Súranján, also called حافر الحمر Gr. κολλικον (D. 4. 84), —*Hermodactyles*. The flowers of this plant are known as اصابع قرمس and شنبليذ.

السياداروان al-Siyádárwán, P. سیاه داروان, Black must.

الشاه بلوط al-Sháhballúṭ, P. شاه بلوط also called قسطل Gr. κάστανα (D. 1. 145),—Chestnut tree.

الشاهترج al-Sháhtaraj, P. شاه ترہ also called بقلة الملك Gr. καπνός. (D. 4. 108),—Fumaria Officinalis.

الشهدانق al-Shahdánaq, P. شاه دانه also called بزر القنب Gr. κάνναβις (D. 3. 155),—Cannabis Sativae semen.

الشاذنج al-Shádhnaj, P. شادنه also called حجر الطور and حجر الدم Gr. αιματιτης λιθος. (D. 5. 143),—Nummulithe.

الشب اليماني al-Shibbu'l-yamání. see الزاج.

الشبت al-Shibt—Anethum.

الشبرم al-Shibrim, Gr. πιτυόσσα (D. 4. 163),

الشبطباطا al-Shabaṭbáṭá, also called عصى الراعي, بطباط, نرسيان داروا, برسيان داروا and جنجر (I. B. vol. 1. p. 89, 102, 173, vol. 3. p. 57, 127.), Gr. πολύγονον, (D. 4. 4.),—Polygonum.

الشبوط al-Shabúṭ,—Carp.

الشبه al-Shabah, also called اشبهان —Brass. It is so called because it resembles gold in colour. Al-Ṭabarí says that it is a metal which is prepared by putting some ناطف (?) on lead (رصاص) but Ibn-Juljul who

is quoted by Ibnu'l-Bayṭár says that it is natural as well as artificial, and that the latter is prepared by means of copper-sulphate (I. B. vol. 3. p. 54.).

شحم الحنظل Shaḥmu'l-Ḥanzal,—The pulp of colocynth.

شقائق النعمان Shaqá'iqu'l-Nu'mán, Gr. ἀνεμώνη (D. 2. 207),—Red Anemone.

الشقاقل al-Shiqáqul, P. شششاقل also known as كوزصحرائي Pastinac Secacul.

الشكاعا al-Shuká'á, also called الشوكة العربية and ذوثلاث الشوكات Gr. ἀκανθα ἀραβικη (D. 3. 13.),—Arabian thorn.

الشيح al-Shíḥ, Gr. ἀψινθιον θαλασσιον (D. 3. 24),—Broom.

الشيطرج al-Shíṭraj, Gr. λεπιδιον (D. 2. 205),—Lepidium.

الشيونيز al-Shewníz, also known as الحبّة السوداء and الكمون الأسود Gr. μελάνθιον (D. 3. 83),—Nigella Sativa.

الصبر al-Ṣibr,—Aloe.

الصعتر al-Ṣ'atar,—wild thyme.

الصفصاف al-Ṣafṣáf, See الخلاف.

الصمغ العربي al-Ṣamaghu'l-'Arabí, See الأقاقيا.

الطالیسفر al-Ṭálísfar.—There is great difference of opinion about the identification of this drug. Avicenna says that it is the bark of some Indian tree, (*Canon* 1. 328.). 'Alí 'Abbás says that it is Indian Olive (*Kitábu'l-Maliki*, vol. 2. p. 116.). Ibnu'l-Bayṭár says that many people think that it is بسباسه (macis). Ibn-Juljul holds that it is لسان العصافير (Ash tree). Ḥonayn, however, has translated μάκερ of Dioscorides (1, 111) as طالیسفر (I. B. 3. 94.).

الطباشير al-Ṭabáshír, also known as زعاد القصب —Sugar of Bamboo.

الطرائيث al-Ṭráthíth.—Lane says that it is *Fallus* or Fungus. L. Leclerc in his translation of Ibnu'l-Bayṭár identifies it with *cynomorium*. Ibnu'l-Bayṭár says about هالوک that it is the name given by Africans and Egyptians to a kind of طرائيث commonly known as جعفيل and called by the Greeks ὀροβάγχη, (D. 2. 171.), meaning اسد الارض (vol. 4. p. 194.). From this it is evident that طرائيث is a general term which includes the above-mentioned Greek plant. Ibnu'l-Bayṭár has mentioned two kinds of it: one red, which is eaten, and the other white which is used as a drug (I. B. vol. 3. p. 101.).

الطرخون al-Ṭarkhún,—Tarragon.

الطرفا al-Ṭarfá. see الأثل.

الطلا al Ṭilá. Al-Ṭabarí means by it sweet wine. It is used in other senses also which are mentioned by Ibnu'l-Bayṭár, (vol. 3. p. 105).

الطين الارمني al-Ṭínu'l-Armaní,—Armenian Bole.

الطين المختوم al-Ṭínu'l-Makhṭúm,—*Terra Sigillata.*

الطين الخوزي al-Ṭínu'l-Khauzí,—Susian Bole. Dr. A. Greenhill in his translation of كتاب الحصبة والجدري says that he did not find this medicament mentioned in any other Arabic book. We also did not find it in any other book except كتاب الحصبة والجدري and the *Fridausu'l-Ḥikmat.* We think that it is identical with χια γη which is called خوزى by the Arabs because it was brought from the place "Chios" (D. 5. 173).

الطهوج al-Ṭíhúj, P. تيهو —Amnoperdis Grisiogularis.

العاقرقرحا al-'Āqarqarḥá,—Feverfew. Ibnu'l-Bayṭár says that the translators have identified عاقرقرحا with *πυρεθρον* of Dioscorides (3. 178), but really it is quite a different plant (vol. 3. p. 114). L. Leclerc in his translation of Ibnu'l-Bayṭár has shown that the *Pyrethrum* is different from the Pyrethron of Dioscorides and identical with عاقرقرحا of the Arabs.

العروق الحمر al-'Urúqu'l-ḥumr, also called فوّة Gr. *'ερυθρόδανον* (D. 3. 150),—*Rubia Tinctorum.*

العروق البيض al-'Uruqú'l-Bíḍ, also called معجلة.—A certain plant which grows and is well-known in Egypt and is used for fattening women (I. B. 4. 157).

العروق الصفر al-'Urúqul-Ṣufr, also called عروق الصبّاغين and بقلة الخطاطيف Gr. *Χελιδονιον* (D. 2. 211.),—*Curcumae Longae Radix.* It is called بقلة الخطاطيف because it blossoms when a certain species of swallows appear, and fades away when they disappear. Some say that it is so named because a certain species of swallows use it as a remedy for the blindness of their young ones (I. B. vol. 3. 119.). Ibnu'l-Bayṭár has mentioned two kinds of it: the big, and the small, which are also mentioned by Dioscorides (2. 211, 212).

العفص al-'Afṣ, Gr. *κηκις*, (D. 1. 146),—Gallnut.

علك الانباط 'Ilku'l-Anbáṭ—Resin of pistachio tree.

العليق al-'Ullayq, also called باطس Gr. *βατος* (D. 4. 37), Rubus Sanctus.

العوسج al-'Usaj, Gr. *ῥαμνος* (D. 1. 119),—*Mespilus Oxyacatha.* It is also known as قُصد and its fruits are called مصع. Al-Ṭabarí identifies it with عليق but Ibnu'l-Bayṭár says that the greatest physician has attributed to it the properties of عليق, which is due to want of experience and observation, because really they are two different drugs of different nature, having different properties (vol. 3. p. 142).

العناب al-'Unnáb,—*Zizyphus Jujuba*.

عنب الثعلب 'Inabu'l-Tha'lab,—*Solanum Miniatum*. There are many kinds of it. كاكنج, *Physalis Alkokenji*, is the male species of the same plant (I. B. vol. 3. p. 135).

عنزروت 'Anzarút, see انزروت.

العود الهندي al-'Udu'l-Hindí, also called عود Gr. ἀγαλλοχον (D. 1. 21.),—Agallochi.

الغار al-Ghár, also called رند Gr. δάφνη (D. 1. 106.),—*Laurus Nobilis*.

الغافث al-Ghafith, Gr. εὐπατώριον (D. 4. 41),—*Agrimonia Eupatoria*. Ibnu'l-Bayṭár says that there is difference of opinion among the physicians of the East and the West as to the identity of this drug, so much so that none of them knows what it is. The African physicians identify it with الطباق which is an error, because الطباق is قونيزا which is mentioned by Dioscorides in his third book (κόνυζα, D. 3. 126). (I. B. vol. 3. p. 145).

الغاريقون al-Ghárfqún, see اغاريقون.

الغالية al-Ghálía, *Galica Moschata*.

الغبيرا al-Ghubayrá. It is identified by Schlimmer with *Elacagnus hortensis*. Ibnu'l-Bayṭár has identified it with ουα of Dioscorides (1. 73), which is identified by Berendes and Leclerc, with *Sorbus*.

الفانيد al-Fánid.—A kind of sweets. Ibn Jazla has described the method of its preparation as follows:—Dissolve pure sugar in water and put it on fire. When it becomes thick, it should be beaten well so that it may become white. When it becomes white, it should be cut into pieces and left for some time in the air so that it may get dry and hard (Bodleian Marsh, 241, f. 128a).

الفجل al-Fujul, Sing. فجلة Gr. ῥαφανις (D. 2. 137.)—*Raphnus Sativus*.

الفراسيون al-Farásiyún, Gr. πράσιον, (D. 3. 109), also called شنار *Marrubum Vulgare*.

الفلونيا الرومي al-Flúnía-al-Rúmí,—*Philonium Romanum*, a medicinal compound which is so called because it was first described by a physician named افيلون, Aphelon (*Canon*, vol. 3. p. 332).

الفنداديقون al-Fandádíqún, Gr. πενδαδικον —Pendadicon.

الفنجكشت al-Fanjkusht. See بخور مريم.

الفو al-Fú,—Garden Valerian.

الفوّة al-Fuwwab, see العروق الصمر .

الفيلزهرج al-Fílzahraj. P. پیل زهره commonly known as حضض Gr. λύκιον (D. 1. 132), Lycii.

القاقلج al-Qáqilaj,—*cardamom*. Two kinds of it are generally used by the physicians قاقله صغار , small cardamom, which is also called خبربوا , هيل بوا , هال بوا , هيل and هال ; and قاقله كبار , Round Cardamom, which is also called هيل غراب and الخبز اليابس .

قثاء الحمار Quthá'-'l-Ḥimár, P. خرخیار —Elaterium.

القردمانا al-Qurdmáná, also called قرطمانا P. كراوياد شتي Cardamomon. Ibnu'l-Bayṭár identifies it with καρδάμωμον of Dioscorides (1. 5.), but Leclerc points out that καρδάμωμον and κάρδαμον, (D. 2. 184), are different plants which are confused by the Arabs (Tr. of I. B. Nos. 1722, 1747).

القرط al-Qarat, also called كراث المائدة and الكراث النبطي Gr. πράσον (D. 2. 178.),—Porrum.

القرط al-Qurṭ, p. شبدر *Trifolium Alexandrinum*.

القرظ al-Qaraz,—*Mimosa Nilotica*.

القرع al-Qara', also called دبا Gr. κολόκυνθα (D. 2. 161.),—Pumpkin.

القرفة al-Qirfa,—*Cinnamon*. Gr. κιννάμωμον.

القرطم al-Qurṭum, also called عصفر Gr. κνικος (D. 4. 187.)—*Cartham; Cartham seed*.

القسط al-Qusṭ Gr. κόστος (D. 1. 15),—Costus.

قصب الذريرة Qaṣbu'l-Dharíra, Gr. κάλαμος (D. 1. 17),—*Chiretta Root*.

القطف al-Qaṭaf, see سرمق .

القطران al-Qiṭrán, also called قدرنا Gr. κέδρος, (D. 1. 105), Cedar tree, *Pix Liquida*.

القلقطار al-Qalaqṭár, see الزاج .

القلقديس al-Qalaqdís, see الزاج .

القنطوريون al-Qanṭúriyún, Gr. κενταύριον (D. 3. 6, 7.),—*Centaury*. There are two kinds of it صغير *common centaury*, and كبير *centaurum officinalis*.

القنبيل al-Qanbíl,—*Kameela*.

القيموليا al-Qímúliá, Gr. κιμωλία γη (D. 5. 175),—Terra Cimolia.

القروقومغما al-Qrúqúmaghmá, Gr. κροκόμαγμα (D. 1. 26; I. B. vol. 4. 17.). The residuum from which the saffron-oil has been expressed.

الكاكنج al-Káknaj, see عنب الثعلب.

الكاشم al-Káshim, Gr. λιγυστικον (D. 3. 51),—*Ligusticum*. Ibnu'l-Bayṭár calls it al-Káshimu'l-Rúmí (vol. 4. p. 44.), which he says different from Kardilon (vo . 4. p. 65.).

الكامخ al-Kámakh, P. كامه (Frankel p. 288.), كوامخ, كوامبخ *vinegar sauce*. Ibn Jazla has mentioned the following method of its preparation: An equal quantity of Penny Royal and salt shou'd be bruised together, and mixed with milk of goat five times as much as Penny Royal, and placed in the sun when it becomes red, spice should be mixed with it according to taste and it would then be ready for use (Bodleian, Marsh. 241. f. 147a.).

الكبر al-Kabar, Gr. καππαρις, (D. 2. 204.),—*Capparis spinosa*. It is also called قضبان العاصة (Bodleian, Marsh 241 f. 38b.) لصف and اصف (I. B. vol. 1. p. 39).

الكتيرا al-Katirá, also known as حلوصيا (I. B. vol. 2. p. 30.). *Gum Tragacanth*.

الكرّاث al-Karráth, Gr. πρασον (D. 2. 178.),—*Allium Porrum*. Ibnu'l-Bayṭár mentions and distinguishes three species of this plant, (Vol. 4. p. 62). This plant should not be confused with خرنوب *Caratonia Siliqua*, which has been identified by Ibnu'l-Bayṭár, with خرنوب (D. 1. 158, I. B. vol. 2. p. 51), cf. Schlimmer's *Terminology*, Ṭehran 1874, p. 1119.

الكراويا al-Karáwiyá, also called القرنباد and القرنفار Gr. καρον (D. 3. 59.),—Caraway seed.

الكرفس al-Karafs, Gr. σελινον (D. 3. 67)—*Celery*. Ibnu'l-Bayṭár has mentioned seven kinds of it which include كرفس جبلي also known as اوراساليون Gr. ὀρεοσελινον (D. 3. 69), and كرفس صخري also called بطراساليون Gr. πετροσελινον (D. 3. 70).

الكركم al-Kurkum. There is some difference of opinion about this drug. Ibnu'l-Bayṭár says that some people identify it with Χελιδόνιον το μεγα of Dioscorides (2. 211.). Ibn Ḥasan says that the Hurd of the Persians is known by the inhabitants of Baṣra as Kurkum (I. B. vol. 4. p. 65). Löw says that the Arabs and Syrians do not understand by Χελιδόνιον τομεγα Chelidonium Majus, but Kurkuma longa, which is the same as the Mamiras of Paulus of Aegania. (*Aram. Pflanzennamen*, Leipzig 1881. p. 220.).

الكزبرة al-Kazbura, also written as كسفرة and كسبرة *Coriander*.

الكركي al-Kurkay,—*Ardea* Virga.

الكمّون al-Kammún, Gr. κύμινον (D. 61. 62.),—*Cumin.*

الكمأة al-Kumát, Gr. ὕδνον (D. 2. 174.),—Truffle.

الكمادريوس al-Kamádariyús, Gr. χαμαίδρυς (D. 3. 112.),—*Teucrium Chamaedrys.*

الكمافيطوس al-Kamáfíṭús, Gr. χαμαιπίτυς (D. 3. 165.),—*Teucrium Chamaepitys.*

الكندس al-Kundus, also called قندس and عود العطاس *Verarlum Album.* Ibnu'l-Bayṭár says that this plant has not been mentioned by Dioscorides nor by Galen, and Ḥonayn and his followers have wrongly identified it with στρουθίον of Dioscorides (D. 2. 195.), which is quite a different plant (I. B. vol. 3, p. 13; vol. 4, p. 86.).

الكنكرزد al-Kankarzad, also called تراب القي *Gundeliae Tournefortii Resina.*

الكندر al-Kundur, also called اللبان (I. B. vol. 4, p. 83.), Gr. λίβανος, (D. 1. 31),—*Frankincense.* Some people say that it is also called سراج الليل because it shines at night. (Berlin Glaser 134, f. 34a.).

الكور al-Kúr, also called مقل and بدليون Gr. βδέλλιον (D. 1. 80.),—*Bdellium.*

الكهربا al-Kahrubá,—*yellow Amber.* It is also called الكيّه al-Kayya, commonly known as مصطكي —Mastich.

اللادن al-Ládan, also spelled with ذ, Gr. λάδανον (D. 1. 128.).—*Ladanum.*

اللبلاب al-Labláb,—*Hedera Helix.* Löw identifies it with κισσός of the Greeks, (*Aram. Pflanz.* p. 140.). Ibnu'l-Bayṭár identifies it with ἕλξινη of Dioscorides, (D. 4. 39, I. B. vol. 4. p. 92.).

اللبني al-Labní, also written as اللبنا see المعية.

لسان الثور Lisánu'l-Thaur, also called بوغلصن Gr. βούγλωσσον (D. 4. 126.),—Bugloss.

لسان الجدي Lisánu'l-Jadí, also called كثير الاضلاع, ذنب الفار and لسان الحمل and commonly known as اذن الجدي Gr. ἀρνόγλωσσον (D. 2. 152.),—Arnoglossum. Some people identify لسان الحمل with لسان الثور, but this is an error (I. B. vol. 4. p. 108.).

لسان العصافير Lisánu'l-'Aṣáfír, *Faxinus Excelsior.* It is also known as سنبل الكلب (I. B. vol. 3. p. 40.).

لحية التيس Liḥyatu'l-Tays, translation of the Gr. word τραγοπώγων, (*Aram. Pflanz.* p. 126; D. 2. 172.),—*Sasify.* Al-Ṭabarí identifies it with هوفكسطيداس Gr. ὑποκιστις (D. 1. 127.), which is supported by Ḥubaysh,

(Bodleian, Marsh, 241, f. 79b.), but Ibnu'l-Bayṭár says that this is an error. According to him it is another plant which grows at the root of لحية التيس (Vol. 4, p. 201). He says that Ḥunayn has translated the Greek word قنذس, κιστος, (D. 1. 126.), لحية التيس and the same plant is generally meant by this word (Vol. 4, p. 105.).

اللوبيا al-Lúbiá, also called الدخر *Kidney beans.*

اللوفا al-Lúfá, also called سرة الأرض, اذن القيس, قدح مريم and قوطليدون Gr. κοτυλη̃δων (D. 4. 90.),—*Cotyledon Umbilicus.*

اللك al-Luk,—*Cummi Locca.*

المازريون al-Mázeriyún, also called معين and زيتون الارض, Gr. χαμαίλαια, (D. 4. 169.),—*Daphne Mezereum.* Ibnu'l-Bayṭár says that some people have identified المازريون with اسد الارض, Gr. χαμαιλέων (D. 3. 8. 9.), on account of the similarity of the two Greek words, which has been the cause of mistakes in the identification of many plants as he has pointed out in his book— الابانة والاعلام بما فى المنهاج من الخلل والاوهام (Vol. 2, p. 46.).

الاميران al-Mámirán, *Chelidonium Magnum.*

الاميثا al-Mámithá, Gr. γλαύκιον (D. 3. 90.),—Glaucium. Schlimmer identifies it with *Scabiosa Arucusis* (p. 505.).

الماهيزهرج al-Máhízahraj, P. ماهيزهره Arabic سم السمك *Verbascum Glomeratum.* Ibnu'l-Bayṭár has identified it with φλμος of the Greeks, (D. 4. 102.). It is also known as شيكران الحوت and بوصير.

المر al-Mur, Gr. σμύρνα (D. 1. 77.),—Myrrh.

المرو al-Marw, also called حبق الشيوخ and ريحان الشيوخ *Marum.*

المرماحور al-Mirmáḥúr,—A kind of Myrrh.

المرتك al-Murtak, also called مرده سنگ *Litharge.*

المحلب al-Maḥlab,—*Padus Mahaleb.* Ibnu'l-Bayṭár says that this plant has not been mentioned by Dioscorides or by Galen (Vol. 4, p. 141.).

المرزنجوش al-Marzanjúsh, also called مرزجوش P. مرزگوش Arabic سمق Gr. σαμψυχον (D. 3. 41a.),—*Origanum Maryorana.*

المصطكي al-Maṣṭakí, see الكيّه and الكهربا.

المقل al-Muqil, see الكور.

مقل اليهود Muqilu'l-Yahúd, see الكور.

الملوخيا al-Malúkhiyá, Gr. μαλαχη (D. 2. 144.), commonly known as خبّازي —*Malva Rotundifolia.*

المرقشيثا al-Marqashithá, Gr. πυριτης λιθος, (D. 5. 142.).

المو al-Mú, Gr. μῦον, (D. 1. 3.),—*Meum.*

الموزد اسفرم al-Múrid Asfaram,—*Myrty communis folia.*

المومياني al-Múmiyá'í, also called مومیا Gr. μουμία Dioscorides, πισσασφαλτος, (1. 100.),—*Pissasphalt.* Ibnu'l-Bayṭár says that the word is used for Pissaphalt, as well as for قفر اليهود, *Asphaltum* and for المومیا القبوري which is found in abundance in Egypt and was used by the Greeks (Egyptians) for the preservation of their dead-bodies (Vol. 4, p. 169.).

الميبه al-Mayba, P. مي بـه Wine of *Cydonium Malum.*

الميعه al-May'a, also called لبني Gr. στακτή (D. 1. 73.), Storax, Rosa Mallas, (Sch. 495.).

الميشبهار al-Míshbahár, see حبّ العالم.

الملح الاندراني al-Milḥu'l-Andarání, also called الملح الداراني, because it is brought from a place known as Darán—Pure crystallised salt. It is also called ملح طبرزد because it is cut into pieces by means of طبر, axe (Berlin Glaser, 134, f. 44b.).

النارکيوا al-Nárkívá. Al-Ṭabarí says that it is the poppy in general, be it white, or black or red; Ibnu'l-Bayṭár says that it is the white poppy, and Ibnu'l-Waḥshiyya says that it is quite a different plant (I. B. Vol. 4, p. 175.).

النانخواه al-Nánkháh—*Sium Ammi.* It is so called because it excites hunger, if it is mixed with flour before it is baked (I. B. Vol. 4, p. 173.).

النبق al-Nabaq,—Lote-tree and its fruit.

النرسيان داروا al-Narsiándáruá, see بطباط.

النعنع al-Na'na',—spearmint.

النفط al-Naft, Gr. νάφθα (D. 1. 101.),—*Naptha.* Al-Ṭabarí says that it gushes forth from the ground, and is of two kinds: black and white.

النمّام al-Nammám, Gr. ἔρπυλλος (D. 3. 40.),—*Avena Sativa.*

النيل al-Nil,—Indigo plant. Ibnu'l-Bayṭár says that the indigo plant of the Arabs is different from that of Dioscorides, and that as the two have generally been confused, people have asrcibed to the former such properties as it does not possess.

الوج al-Wajj, Gr. ἄκορος (D. 1. 2.)—*Calamus Asiaticus.*

الورس al-Wars,—*Memecylon Tinctorium.*

الوسمة al-Wasma. Schlimmer identifies it with *Indigoferae Folia.* Ibnu'l-Bayṭár and Avicenna also identify it with the same, but Leclerc says that two different drugs of this name have been confused by the Arabs (Tran. of Ibnu'l-Bayṭár Nos. 2244, 2291. ft. note).

الورسياوشان al-Warsiáushán, see البرسياوشان.

الهال al-Hál, see قاقلج.

الهازرجشان al-Hazárjashán, also called ناشيرا —*Bryonia Alba.*

الهندبا al-Hindbá, Gr. σέρις (D. 2. 150.),—*Cichoreum Intybus.*

الهيرون al-Hírún.—A kind of dates.

الهيوفاريقون al-Hayúfáríqún, Gr. ὑπέρκον (D. 3. 161.),—*Hypericum perforatum.*

الهيوفسطيداس al-Hayúfasṭídás, Gr. ὑποκιστις (D. 1. 127.),—*Cytinus Hypokistis.* see لحية التيس.

اليبروح al-Yabrúḥ, Gr. μανδραγόρας, (D. 4. 76.), *Atropa Mandragora.*

الينبوت al-Yanbút. Al-Ṭabarí says that it is Carob, but Ibnu'l-Bayṭár says that it is a particular species of it (Vol. 4, p. 210.).

APPENDIX (3)

ARABIC MEDICAL TERMS.

In this appendix an attempt has been made to show the exact significance of the technical terms used by the Arabic medical writers. It is very difficult to find the exact equivalents for them in the modern medical vocabulary which is very often based on quite different Pathological and Physiological theories. The significance of some terms, therefore, has been explained in long passages. In many places the original Greek terms also are given. The main guides for this have been the Greek words mentioned by the Arabic writers in Arabic form. But in some cases also the Greek terms mentioned by Dr. Neuburger, Celsus and other European writers are put in, and their meanings are compared with the connotations of the Arabic terms. In some cases the Greek texts were also referred to, with the help of Mr. E. J. Thomas the Under-Librarian in Cambridge University library. There may be some mistakes in connection with these Greek terms but I am sure they are not many.

The following abreviations have been used :—

Gr. — Greek.

S. — Sanskrit.

Göttingen 99 Arab refers to the manuscript of Kitábu'l-Fuṣúl of Músá b. 'Ubaydalláh of Cordova who in the 23rd Discourse of this book has explained the meaning of Arabic medical technical terms.

الابتداء al-Ibtidá, the first stage of fever or inflammation. The Arabs following the Greeks divided the progress of fever and inflammation into four stages: الابتداء, the beginning, Gr. ἀρχή; الصعود or التزيّد, the rise, Gr. ἀναβασις; الانتها, the height, Gr. ἀκμή; and الانحطاط or الهبوط, the fall, Gr. καταβασις (al-Ḥávi, Bodleian, 3 Marsh, 156. F. 260).

الاثر al-Athar, pl. آثار, also called العلامة, the Symptom.

الاثير al-Athir, Gr. αἰθήρ, the Etherial atmosphere.

احتباس الميضه Iḥtibásu'l-Hayḍa, Dumb Cholera, Gr. χ-ζηρα.

الإختلاج al-Ikhtiláj, also called خفقان Palpitation, Gr. πνδμος.

الاختلاف al-Ikhtiláf, to suffer from خلف Diarrhoea.

اختناق الرحم Ikhtináqu'l-Raḥim, Hysteria, Gr. ὑστερικὴ πνιξ.

الأُدرة al-Adra, Serotal-Hernia, Gr. ἐντερόκηδη.

الأُربيه al-Urbiya, Tumour, Gr. βουβών.

الإرتعاش al-Irti'ásh, Suffering from الرعشه, Tremor. See الرعشه.

الأُسّ al-Uss, Diagnosis, الأساس الذى يبتنى عليه الشفاء هو اجادة الطبيب البحث عن الداء و التحقيق منه, equivalent to التشخيص — (Diwán Ibnu'l-Rúmí, Cairo 1917, annotated by Sheikh Md. Sharíf Salím, Line 9, page 15). It is also used in certain astronomical sense.

الأُسر al-Asr, Ischury, Gr. ισχυρια.

الاستسقاء al-Istisqá, Dropsy Gr. ὕδρωψ.

الاستسقاء الزقي al-Istisqáu'l-Ziqqí, Ascites, Gr. ἀσττικη ὑδρωψ ἀοκιτης.

الاستسقاء الطبلي al Istisqáu'l-Ṭabalí, Tympanites, Gr. τυμπανιτης ὑδρωψ.

الاستسقاء اللحمي al-Istisqáu'l-Laḥmí, Hydrops anasarc, Gr. ὑποσαρκίδιος also ἀνάσαρξ.

الاستحالة al-Istiḥála, Impossibility; Metamorphosis, Gr. ἀλλοίωσις. There are two kinds of it, in its latter sense: كون change from lower to higher form, and فساد change from higher to lower ferm.

الاسترخاء al-Istirkhá, It is generally used in the loose sense of relaxation, but in its strict sense it denotes complete loss of the power of movement and sensibility; whereas الخدر which is also used in the same loose sense, means only a partial loss of those powers. (Göttingen. Arab. 99. f. 134b). Comp. *Kámilu'l-Ṣiná'at*. Vol. I. p. 334. Gr. παραδυδις.

استطلاق البطن Istiṭláqu'l-Baṭn, Relaxation of the bowels, Gr. κοιλίας ῥυσις.

الاستفراغ al-Istifrágh, Evacuation of matter from the body. Some times it is used for evacuation in general, and sometimes for evacuation by means of the use of emetics, Gr. ψαρμακευειν κενδις ανω κατω.

الاستمراء al-Istimrá, Digestion, Gr. πέψος.

الاستواء الاول al-Istiwáu'l-awwal, Vernal Equinox, Gr. ἰδημερία ξαρινή or ἐαρινη.

الاستواء الثانى al-Istiwáu'l-thání, Autumnal Equinox, Gr. ὀπωρινή.

الاشتمال al-Ishtimál, To be pregnent, Gr. κυειν κεηδις.

الافيلمسيا al-Ifilímsiá, Gr. ἐπιλῆψια also called الصرع and المرض الكافني Epilepsy. Being a foreign word, it has been spelt in Arabic Mss. as well as printed books, in many different ways, like ابرقلسيا, ايلمسيا, ايباما, etc.

الآكلة al-Ākila, gangrene, Gr. γαγγραινα.

الاكحل al-Ikḥal, Median cataneous vein.

الامتلاء al-Imtilá, Plethora, Gr. πληθώρη ; as opposed to الخلا, emptiness, Gr. κένωσις.

الامهات الاربعة al-Ummahátu'l-Arba'at. The four elements.

الآنية al-Aniyat. Vein.

انتفاخ الملتحمة Intifákhu'l-Multaḥimá. Inflammation of the conjunctiva.

الاوج al-Auj, S. Ojas, Vital power (*Susrúta*. Vol. 1. p. 130). According to Charaka, it is a quantity of slightly yellowish blood, which resides in the heart, through the attenuation and loss of which death may follow.

اوعية الدماغ Au'iyatu'l-Dimágh. The Cavities of the brain, Gr. νὶ κοιλίαι τυδ ἐγκφάλοι.

ايلاوس Ilaus, Gr. εἰλεός, Ileus.

الباسليق al-Básalíq, Gr. φλεψ βασιλκη vena Basilica.

البثر al-Bathir, pl. بثور Pustula, Gr. φλκταινα.

البخار al-Bukhár, vapour, effluvium ; fever.

البرسام al-Barsám, Per. بر = chest, and سام, inflammation = pleurodyne. (*Canon*. Vol. 2. p. 34 ; Lane. Bk. I, p. 187). Al-Majúsí seems to identify it with Paraphrenitis or inflammation of the diaphragm. (*Kámilu'l-Ṣiná'at*. Vol. I, p. 327). Compare Schlimmer, p. 186.

البرص al-Baraṣ, Leprosy.

البهق al-Bahq. Alphus. For the difference between البرص and البهق, see *Kámilu'l-Ṣiná'at*. Vol. 1. p. 311. بهق affects only the surface of the skin, whereas برص goes deep into the part of the body affected by it.

البرد al-Bard, The coldness of the surface of the body and muscles ; قشعريرة is that state of the body in which one feels one's flesh creep and sometimes feels نخس, pricking sensation which is accompanied by wrinkles or cramps ; and نافض is rigour and shivering. (*Canon*. Vol. 3 p. 20).

البحران al-Buḥrán, Crisis يوم البحران is the critical day of a disease.

البلة al-Ballat ; also called الرطوبة Moisture Gr. ὑγρότης.

بلة الأذن Ballatu'l-Udhun, also called رطوبة الاذن moisture of the ear, Gr. τῆς ὠτων ὑγροτητες.

بلة الأنف Ballatu'l-Anf, also called رطوبة الانف and رطوبة المنخرين, moisture of the nose, Gr. ῥινῶν ὑγρότητες.

بلّـة العين Ballatu'l-'Ayn, also called رطوبة العين, Tears, Gr. ὀφθαλμῶν ὑγρότητες.

البلغم al-Balgham, Gr. φλέγμα, Phlegm.

البلغم المالح al-Balghamu'l-Málih, Salty Phlegm, Gr. φλεγμα ἁλμυρόν.

البلغم الحامض al-Balghamu'l-Ḥámiḍ, Acid Phlegm, Gr. φλέγμα ὀξύ.

البلغم الحلو al-Balghamu'l-Ḥulw, Sweet Phlegm, Gr. φλέγμα γλυκύ.

البلغم الزجاجى al-Balghamu'l-Zujájí, (υλλωδες) Praxagores, ap. Galen. VII. b. 34. He called phlegm the υαδωδις χυμος VII 138

البـول الرملى al Baulu'l-Ramlí, Sandy urine, Gr. ψαμμώδης, Galen. XIX b 12.

البول السـويقى al-Baulu'l-Sawíqí, Gr. κριμνώδης, 'mealy urine'. Galen. XIX b 12.

البول الصفائحى al-Baulu'l-Ṣafáiḥí, Gr. πεταδμς flady scaly IX 603 or χολώδες bile coloured XIX 613.

البول النخالي al-Baulu'l-Nikhálí, Gr. πιτυρώδης 'branlike urine', Galen XIX b 12.

بوليموس Búlímús, Gr. βούλιμος Bulimy.

البهـر al-Bahr, See ضيق النفس.

البيضيـه al-Bayḍiyya, الرطوبة البيضيـة, Aqueous Humour.

البيانام al-Bayánám, Exercise, Gr. γυμναοιϰ ἄσκηδος.

التخمة al-Tukhma, also called سوء الاستمراء, Indigestion.

التحليل al-Taḥlíl, Analysis; Dissolution (of a tumour or inflation), Gr. διυφίρτοις.

التخلخل al-Takhalkhul, Expansion, Gr. διϰοτοδή.

التكاثف al-Takáthuf, Contraction, Gr. συστοδή.

تقطير البول Taqṭíru'l-Baul, Straugury.

التكميد al-Takmíd. Fomentation, Gr. πυρια.

التشنّج al-Tashannuj, Convulsion, Gr. δπαδμός.

التمطي al-Tamaṭṭí, Pandiculation, Gr. χάδμη χάυκων.

التوثـة al-Tautha, Glandula; Gr. θύμος.

الثـآلول al-Thá'lúl, pl. ثآليل, Wart. Gr. ἀϰρωχορδών.

الجدري al-Jadrí, al-Jadari, al-Judurí, Small-pox.

الجرب al-Jarab, Dry scab, Gr, ψώρα.

الجذام al-Judhám, Tubercular Leprosy. See داء الفيل.

جرب العين Jarabu'l-'Ayn, Celiary Blepharitis.

الجساة al-Jusát, Sclerophthalmia.

جحوظ العين Juḥúẓu'l-'Ayn, Gr. *πρόπτωσις*.

الجنون al-Junún, Madness. In جنون as well as موسام, the patient loses his reason, but the former is without fever, and the latter is attended with fever.

الجنس al-Jins, Gr. *γένος* genus (Logic).

الجوهر al-Jauhar, Substance, as opposed to attribute known as عرض. The latter word is also used in the sense of 'accident (Logic) as opposed to خاصه, 'proprium'.

الجوهر الفرد al-Jaubaru'l-Fard, Atom, Gr. *μονάς*. It is also called الجزء الذي لا يتجزي, which is probably a translation of the Greek term.

الجهر al-Jahr, Sunblindness. (*Canon*. Vol. 2, p. 142). Gr. *ἄτομος*.

حبّ القرع Ḥabbu'l-Qara', Taenia, Gr. *ταινία*.

حبس البول Ḥabsu'l-Baul, also called حصر البول Suppression of urine; straugury.

الحجاب al-Ḥijáb, Diaphragm, Gr. *ψὰν ψρένες διαφρυγλα*.

الحد al-Ḥadd, Definition, Gr. *ὁρισμός*, as opposed to رسم Description, Gr. *χαρακτής*, (Logic).

الحرارة الغريزية al-Ḥaráratu'l-Gharízíyya, Natural heat, Gr. *ἔμφυτον θερμόν*.

الحركة الارادية al-Ḥarakatu'l-Irádiyya, Voluntary movement.

الحركة الاضطرارية al-Ḥarakatu'l-Iḍṭiráriyya, Involuntary movement.

الحركة الطبيعية al-Ḥarakatu'l-Ṭabi'iyya, Natural movement.

الحركة القسرية al-Ḥarakatu'l-Qasriyya, unnatural movement.

حرقة البول Ḥurqatu'l-Baul, Gonorrhœa.

الحصبة al-Ḥaṣba, Measles.

الحصف al-Ḥaṣf, a kind of skin eruption which causes the itching of the body in the day, as opposed to الشري in which the body itches at night.

الحكة al-Ḥakka, Itching, Gr. *ξυσμός*.

حكة العين Ḥakkatu'l-'Ayn, Itching of the eye.

الحكمة al-Ḥikmat, Science as opposed to الصناعة, which is art. Gr. ἐπιστήμη τέχνη.

الحمى al-Ḥummá, Fever, Gr. πυρετός.

حمّى اقطيقوس Ḥummá Aqṭiqús, also called حمّى الدق (*Kámilu'l-Ṣiná'at*, Vol. 2. p. 303). Gr. ἑκτικός, Hectic fever.

حمّى افيماروس Ḥummá Afímárús, generally known as حمّى اليوم. Gr. πυρετὸς ἐφήμος, *Febris Diara*.

حمّى التعب Ḥummá'l-Ta'ab, Fever due to fatigue.

حمّى السهر Ḥummá'l-Sahar, Fever due to sleeplessness.

حمّى الغضب Ḥummá'l-Ghaḍab, Fever due to anger.

حمّى الفكر و الغم Ḥummá'l-Fikr-wa'l-Ghamm, Fever due to anxiety and grief.

حمّى حرّ الشمس Ḥummá Ḥarri'l-Shams, Fever due to the heat of the sun.

حمّى انقرياقوس Ḥummá Anqaryáqús, Gr. ἀναφορικός; generally known as حمى البلغم, Febris Pituitosa.

حمّى اميطراطاؤس Ḥummá Amiṭráṭáus, generally known as شطر الغب Gr. ἡμιτριταῖος, Semitertian.

حمّى سوناخوس Ḥummá Súnákhús, generally known as حمى الدم; Gr. σύνοχος. Inflammatory fever.

حمّى طراطاؤس Ḥummá Ṭiráṭáus, Gr. πυρετὸς τριταῖος, commonly called حمى الغب and حمى مثلثه; Tertian Fever.

حمّى طيطراطاؤس Ḥummá Ṭiṭráṭáus Gr. πυρετος τεταρταιος generally known as حمى الربع Quartan Fever.

حمّى قوسوس Ḥummá Qúsús, Gr. καῦσος, generally called حمى محرقة and حمى ملهبة, Causus.

الحمى الحادة al-Ḥummá'l-Ḥáddat, Acute fever, Gr. πυρετὸς ὀξύς

حمى الازمنه Ḥummá'l-Azminah, Chronic Fever, Gr. χρονικός.

الحمى المركبة al-Ḥummá'l-Murakkaba, also called الحمى المغلطه. Compound or mixed Fever, Gr. πυρετὸς πλανητε (?)

حمى النافض Ḥummá'l-Náfiḍ, Fever accompanied with rigour, Gr. ῥῖγος.

الحمى الدائرة al-Ḥummá'l-Dáira, Intermittent fever, Gr. πυρετὸς διαδεπων.

الحمول al-Ḥamúl, Suppository, Gr. βαδανὸς.

الحنجرة al-Ḥanjara, Lorynx.

الخدر al-Khidr. This term has been used in different senses by different authors. Most of them take it in the sense of الرعشة Trembling. (*Canon*. Vol. 2, p. 107). See also الاسترخاء.

الخرزة al-Kharzat, (خرزة الرقبة), Ponum Adami, Gr. θυρεοειδὴς χόνδρος.

خفقان Khafaqán, see al-Ikhtiláj الاختلاج.

الخلط al-Khilṭ, pl. الاخلاط, Humours; mixtio, Gr. μιξεις χυμων.

الخناق al-Khunáq, Gr. κυνάγχη, Anqina, cf. *Celsus on medicine* by A. Lee, 1831, Vol. 1, p. 257 and *Canon*. Cairo Vol. 2, p. 200. This disease is generally identified with الذبحة of the Arabs. Al-Majúsí has differentiated between the two diseases. He says امّا الخوانيق فيكون حدوثها من ورم حارّ يعرض لعضل الحنجرة that Khunáq is due to the inflammation of the muscles of the larynx, whereas امّا الذبحة فيكون عروضها من ورم حارّ يعرض al-Dhibḥá, Gr. συνάγχη is due to the inflammation of the muscles of the throat, or those of the gullet (كامل الصناعة ٢ ص ٣٥٠).

الخلفة al-Khilfa, Diarrhoea.

الخلا al-Khalá, See الامتلاء.

داء الاسد Dáu'l-Asad, Early stage of Tubercular Leprosy, Gr. λεοντιασις.

داء الثعلب Dáu'l-Tha'lab, Alopecia, Gr. ἀλωπεκια.

داء الحية Dáu'l-Ḥayyat, Ichthyosis Gr. ὀφιασις. The difference between the داء الثعلب and the داء الحيه is that in the case of the first disease the hairs of the head fall off, but the skin is not affected; and in the case of the second the skin is also affected (*Canon*. Vol. 3, p. 267).

داء الفيل Dáu'l-Fíl, Elephantiasis. This disease has been wrongly identified by some Orientalists with جذام, Tubercular Elephantiasis. In داء الفيل only the feet of the patient get swollen and become like those of the elephant, while in جذام the whole body is thus affected. (*Kámilu'l-Ṣinā'at*. Vol. 1, pp. 310, 313. *Canon*. Vol. 2, p. 611).

الدبيلة al-Dubayla, Abcess Gr. αποστασις.

الدمعة al-Dam'a, Epiphora.

الدوار al-Duwár, Vertigo Gr, σκοτωμα υκοτοδινια.

الدوالي al-Dawálí, Phlebectasia. The dilatation of the veins of the legs هو اتّساع عروق الساق (*Canon*. Vol. 2, p. 611).

الدیافراغما al-Diáfrághmá, Gr. διάφραγμα, Diaphragm.

الدوس al-Dús, S. Dhoshas, Humours (*Susrúta*. Vol. 1, p. 121).

الدهاتو al-Dhátú, S. धातु, the fundamental principle of the body (*Susrúta*. Vol. 1, p. 121).

ذات الجنب Dhatu'l-Janb, also called وجع الجنب or شوصة Pleurisy. Gr. πλευρίτις.

ذات الرية Dhátu'l-Riya, also called وجع الرية, Pneumonia, Gr. πνευμονία.

ذات اليسار Dhátu'l-Yasár, Inflammation of spleen, Gr. (η)τοῦ σπδήνος φλεγμονή.

ذات اليمين Dhátu'l-Yamín, Inflammation of liver, Gr. (η)τῆς ἥπατος φλεγμονή.

الذبحة al-Dhibḥa, Diphtheria. See الخناق.

راس الطبائع Rásu'l-Ṭabái', See الطبائع.

الرباط al-Ribáṭ, Ligaments, Gr. συνδεσμός.

الربو al-Rabw, Inflation; asthma.

الرسوب al-Rusúb, Sediment, Gr. ὑπόδρασις.

الرطوبة al-Ruṭúbat, Moisture Gr. ὑγρότης.

رطوبة العين Ruṭúbatu'l-'Ayn. See بلّة العين.

رطوبة الاذن Ruṭúbatu'l-Udhun. See بلّة الاذن.

رطوبة الانف Ruṭúbatu'l-Anf. See بلّة الانف.

الرطوبة الزجاجيه al-Ruṭúbatu'l-Zujájíya, Vitreous humour, Gr. ὑαλοειδὲς ὑγρόν.

الرطوبة الجليديه al-Ruṭúbatu'l-Julaydiyya, Crystalline lens, Gr. κρυσταλλοειδὲς ὑγρόν.

الرطوبة البيضية al-Ruṭúbatu'l-Bayḍiya, See Bayḍiya.

الرطي al-Raṭí. See القوبا.

الرعدة al-Ra'da, Tremor.

الرعشة al-Ra'sha. 'The difference between الرعدة and الرعشة is this that the latter is due to permanent nerve-affection, while the former is caused by temporary exhaustion and weekness of the limb. Göttingen. Arab 99. f. 134b.

ريح الخصية Ríḥu'l-Khuṣya, Hydrocele.

الرياح العارضة فى الرحم Al-Riyáḥu'l-'Áriḍat-fí'l-Raḥim, Tympanitus Uterinus.

ريح السبل al-Ríḥu'l-Sabal, also called السبل Pannus, Gr. ξηροφθαλμία.

الزحير al-Zaḥír, also called دوسنطاريا, Gr. δυσεντερία; Dysentery.

الزرقة al-Zarqa, a kind of cataract, Gr. γλαύκωσις.

الزكام al-Zukám, Nasal catarrh, Gr. κόρυζας.

زلق الامعاء Zalaqu'l-Am'á,' Lienteria, Gr. λειεντερία.

السبات al-Subát, Lethargy, Gr. λήθαργία. It is also called النسيان.

سحج الامعاء Saḥju'l-Am'á,' Abrading of the intestines, Gr. ξυδις των εντέρων.

السدر al-Sadar, Dizziness, Gr. σκοτοδινία.

السعال al-Su'ál, Cough, Gr. βήξ.

سقوط اللهاة Suqúṭu'l-Lahát, Falling or enlargment of the Uvula, Gr. ὀταφυλή.

السكتة al-Saktat, Apoplexy.

السل al-Sill, Consumption, Gr. ψάιδις.

سلس البول Salsu'l-Baul, also called ذيابيطا, Gr. διαβετες زلق الكلية etc. Diabetes.

السلاق al-Suláq, Lippitude of the eye-lid.

السمسانية al-Samsánía, Condyle.

السهر al-Sahar, Insomnia, Gr. ἀγρυπνία.

السنورتا al-Sanwartá, Headache. See *Arabian Medicine*, page 35.

الشترة al-Shatra, Inversion of the eye-lid; terpion.

الشرج al-Sharj, Perinaeum, Gr. σφιγκτήρ.

شرج المثانة Sharju'l-Mathána, Sphincter Vesicae, Gr. κυτεως σφιγκτήρ.

الشري al-Sharí. See القصف.

الشريان al-Shiryán, Artery.

الشرناق al-Sharnáq زيادة من مادة شحمية تحدث فى الجفن الاعلى - اوراطيس Gr. χαλάζιον.

الشقيقة al-Shaqíqat, Hermicrania, Gr. ημικρανία.

الشهوة الكلبية al-Shahwatu'l-kalbiyya, Canine appetite, Gr. κυνώδεις ορέξεις.

الشوصة al-Shauṣa. See ذات الجنب.

الصافن al-Ṣáfin, Vena Saphena.

الصداع al-Ṣudá', Headache Gr. κεφαλαλγία.

الصدغين al-Ṣudghayn, Temples, Temple Veins.

الصرع al-Ṣara'. See ابيلبسيا.

الصفاق al-Ṣifáq, Peritoneum.

الصناعة al-Ṣiná'at. See الحكمة.

الصورة al-Ṣúrat, Form, Gr. ειδος.

الضفدع al-Ḍifda', Ranula, Gr. υπογλωττιον — βατραχος.

الضماد al-Ḍamád, Plaster, Gr. καταπλασμα — εμπλαστρος.

الطاعون al-Ṭá'ún, pl. طواعين Plague Gr. λοιμος.

الطبيعة al-Ṭabí'at, pl. طبائع Nature, element.

الطبائع المفردة al-Ṭabái'u'l-Mufradat, also called الطبائع البسوطة, Primary elements.

الطبائع المركبة al-Ṭabái'u'l-Murakkabat, Secondary elements, راس الطبايع The source of elements.

الطبقة الشبكية al-Ṭabaqatu'l-Shabakiyya, Retina Gr. αμφιβληστροειδης χιτων.

الطبقة العنبية al-Ṭabaqatu'l-'Inabiyya, Iris of the Eye, Gr. ραγοειδης χιτων.

الطبقة القرنية al-Ṭabaqatu'l-Qarniyya, Cornea of the eye, Gr. κερατοειδης χιτων.

الطرفة al-Ṭurfa, Bloodspot in the eye, نقطة من دم طوي (*Canon*. Vol. 2, p. 128).

الظفرة al-Ẓufrat, Pterygium.

الظلمة al-Ẓulmat, Dimness of the eye-sight, Gr. αμβλυωπια.

العدس al-'Adas, Red pimples on the face.

العرض al-'Araḍ, Accident, Gr. συμβεβηκος cf. الجوهر.

عرض المرض 'Araḍ-u'l-Maraḍ, Accident of a disease.

عرق النسا 'Irqu'l-Nisá, Sciatica, Gr. ισχιας.

العفج al-'Afaj, Intestine, Gr. εντερον.

العقل al-'Aql, Intelligence, Gr. νους.

العقل بالفعل al-'Aql-bi'l-Fi'l, Actual intelligence, Gr. ενεργεια νους (εντελεχεια νους).

العقل بالقوة al-'Aql-bi'l-Quwwat, Potential Intelligence, Gr. δυναμει νους.

العقل الفاعل al-'Aqlu'l-Fá'il, Active intelligence, Gr. νους ποιητικος.

العقل المنفعل al-'Aqlu'l-Munfa'il, Passive intelligence, Gr. νους παθητικος.

العقل الكلّي al-'Aqlu'l-Kullí, Universal intelligence, Gr. νους.

العقل الجزوي al-'Aqlu'l Juzwí, Partial intelligence, Instinct.

العلّة al-'Illat, cause as opposed to معلول, effect; cause of disease Gr. αἰτιον; العليل the sick.

الغدة el-Ghudda, Pestilential bubo.

الغشاء al-Ghishá,' Membrane, Gr. μηνιγξ.

الغشاء الرقيق al-Ghisháu'l-Raqíq, Thin Membrane Gr. λεπτη μηνιγξ.

الغشاء الغليظ al-Ghisháu'l-Ghalíz, Thick Membrane Gr. παχεια μηνιγξ.

الغشاء الصلب al-Ghisháu'l-Ṣalb, Hard Membrane Gr. σκληρα μηνιγξ.

الغشاء اللين al-Ghisháu'l-Layyin, Soft Membrane Gr. μαλακη μηνιγξ.

الفالج al-Fálij., Paralysis.

الفتق al-Fitaq, Hernia Gr. κηλη.

الفراغما al-Firághmá, Gr. φραγμα.

الفساد al-Faṣád. See, الاستحالة.

الفسدخ al-Fasdakh. See, البيضه.

الفصل al-Faṣl (logic) Differentia Gr. διαφορα.

الفقرة al-Faqra, pl. الفقار vertebra Gr. οφινδυλος.

فم الرحم Famu'l-Raḥim, Superior orifice of the uterus Gr. στομιον της υστερας.

فم المعدة Famu'l-Mi'da, Superior orifice of the stomach Gr. στομα της γαστορος γαοτροι.

الفنطاسيا al-Fanṭásia, Gr. φαντασια, Fantasy.

الفواق al-Fuwáq, Hiccough, Gr. λυγξ.

قحف الراس Qiḥfu'l-Ra's, The Skull, Gr. βασις της κεφαλης τσ τις μεφαδης οστεον.

قرني الرحم Qarnai'l-Raḥim, Fallopian Tube Gr. κερεια τηι μητρας.

القوع al-Qara', Pustules Gr. φλυηταινα.

قصبة الريه Qaṣbatu'l-Riya, Wind-pipe Gr. τραχεια αρτηρια.

القلاع al-Qulá', Sing. قلع Aphthai Gr. ἀφθαι بثور حادة فى سطح اللسان مع اتساع و انتشار — (Margin of Berlin Mss).

القمل al-Qaml, Lice Gr. φθειρες.

القمل فى الاجفان al-Qaml-fi'l Ajfán, Lice of the eye-lashes, Morbis pedicularis, Gr. φθειρίασις, εν βλεφάρωνις φθείρες.

القوبا al-Qúbá, pl. القوبى, Exanthuma Gr. ἐξάνθημα.

القوة al-Quwwat, pl. القوى, Power, energy, faculty, force Gr. δύναψις.

القوة بالفعل al Quwwat-bi'l-Fi'l, Kinetic Energy, Gr. ἐνεργεία.

القوة بالامكان al-Quwwat-bi'l-Imkán, Potential Energy Gr. δυνάμει.

القوة الغاذية al-Quwwatu'l-Ghádhiyya, the Nutritive Power Gr. δύναμις θρεπτική.

القوة النامية al-Quwwatu'l-Námiyya, the augmentative Power Gr. ὐξητικὴ.

القوة الجاذبة al-Quwwatu'l-Jadhiba, the Attractive Power Gr. δύναμις ἑλκτική.

القوة الماسكة al-Quwwatu'l-Másika, the Retentive Power Gr. δύναμις καθεκτική.

القوة الهاضمة al-Quwwatu'l-Háḍima, the Digestive power Gr. δύναμις ἀλλοιωτική.

القوة الدافعة al-Quwwatu'l-Dáfi'a, the Repelling Power Gr. δύναμις πρωστική.

القوة الحيوانية al-Quwwatu'l-Ḥaywániyya, also called الروح الحيواني = Spiritus animalis Gr. πνεῦμα ψυχικόν.

القوة الطبيعية al-Quwwatu'l-Ṭabí'iyya, also called الروح الطبيعي = Spiritus Naturalis Gr. πνεῦμα φυσικόν.

القوة النفسانية al-Quwwatu'l-Nafsániyya, also called الروح النفساني = Spiritus Vitalis Gr. πνεῦμα ζωτικόν.

الكابوس al-Kábús, Incubus.

كثير الارجل Kathíru'l-Arjul, Polypus Gr. πολύπους.

الكزاز al-Kuzáz, Tetanus Gr. τέτανος.

الكلى al-Kullí, (logic) general term.

الكليتين al-Kulyatayn, Kidneys Gr. νεφροι.

الكماد al-Kumád. See التكميد.

الكمية al-Kammiyya, Quantity.

الكون al-Kaun. See الاستحالة.

الكى al-Kayy, Cauterisation Gr. καῦσις.

الكيلوس al-Kaylús, Gr. χυλός Chyle.

الكيموس al-Kaymús, Gr. χυμός Chyme.

الكيموسات الطبيعية al-Kaymúsát-u'l-Ṭabí'iyya, Natural Chymes

اللزوق al-Lazúq, Poultice, Gr. καταπλασμα.

اللعوق al-La'úq, Linctus.

اللصوق al-Laṣúq, Plaster Gr. ἔμπλαστρον.

اللقوة al-Laqwa, Facial Paralysis.

الماء al-Má', (نزول الماء) Cala.

الماء الاصفر al-Máu'l-Aṣfar. See الاستسقاء.

الماساريقا al-Másáríqá, Meserteric Veins Gr. μεσαραικαὶ φλεβες.

المآقى al-Ma'áqí, The interior angle of the eye Gr. ὁ μέγας κανθος

المحسوس al-Maḥsús, pl. المحسوسات Physical Phenomena.

المعقول al-Ma'qúl, pl. المعقولات, Mental Phenomena.

المراق al-Miráq, Hypochondria.

مرّة السودا Mirratu'l-Saudá, Black bile Gr χολὴ μέλαινα.

المرض الحاد al Maraḍu'l-Ḥádd, Acute disease Gr. πάθος ὀξύ.

المرض الكاهني al-Maraḍu'l-Káhiní, Epilepsy Gr. πάθος ἱερόν.

المرض المزمن al-Maraḍu'l-Muzmin, Chronic disease Gr. πάθος χρόνιον.

المرض الوبائي al-Maraḍu'l-Wabáí, Epidemic disease.

المزاج al-Mizáj, Complexion Gr. κρασις.

المعى al-Ma'á', pl. الامعاء Intestine.

المعى الاعور al-Ma'áu'l-A'war, Blindgut Gr. τυφλὸν ἔντερον.

المعى الصائم al-Ma'áu'l-Ṣáim, Intestinum Jejunum Gr. νῆστις.

المعى الطويل al-Ma'áu'l-Ṭawíl, Ileum Gr. τὸ λεπτὸν ἔντερον.

المعى القولون al-Ma'áu'l-Qúlún, Gr. κόλον Colon.

المعى المستقيم al-Ma'áu'l-Mustaqím, Intestinum rectum Gr. εὐθυσμένον ἔντερον.

المقولة al-Maqúla, pl. المقولات (logic) also called القاطيغورياس Gr. κατηγορία; Categories.

These categories are ten in number:—one is جوهر Substance, and the rest belong to the class of عرض, attribut. They are: كم, quantity; كيف, quality; اضافة, relation; اين, Space; متى, time; وضع, coliocation; ملك, possession; فعل, action; and انفعال, passivity.

الملتحمة al-Multaḥima, Conjunctive coat of the eye.

المورسارة al-Maurisára, Sanskrit—Maúktka = pearls + Sara = line; pearly white spots in the eye; smuts, cataracts.

المـوم al-Múm, generally called الزكام, Nasal Catarrh.

المهابوت al-Mahábút, Sans. Mahābuta: Elements.

الناسور al-Násúr, Fistula.

النبض al-Nabḍ, Pulse Gr. σφυλμός.

النبض الاطول al-Nabḍu'l-Aṭwal, Long pulse Gr. μακρός.

النبض الأعرض al-Nabḍu'l-A'raḍ, Broad pulse Gr. πλατύς.

النبض الصغير al-Nabḍu'l-Ṣaghír, Small pulse Gr. μικρός.

النبض الكبير al-Nabḍu'l-Kabír, Big pulse Gr. μέγας μακρος.

النبض القوى al-Nabḍu'l-Qaví, Vehement pulse Gr. σφοδρός.

النبض الضعيف al-Nabḍu'l-Ḍa'íf, Feeble pluse Gr. ἄτονος ἀμυδρός.

النبض المستوى al-Nabḍu'l-Mustaví, Equal or regular pulse. Gr. σφυλμὸς ὁ μαλός.

النبض الغير المستوي al-Nabḍu'l-Ghayru'l-Mustaví, Unequal pulse Gr. σφυλμὸς ἀν ὡμαλός.

النبض الطبيعي al-Nabḍu'l-Ṭabí'í, Natural pulse Gr. σφυλμός ὁ κατὰ φύσις.

النبض العرضي al-Nabḍu'l-'Araḍi, Accidental pulse Gr. σφυλμός ὁ παρὰ φυσιν.

النبض المبسوط al-Nabḍu'l-Mabsúṭ, Simple pulse Gr. καθένα ορυγμόν.

النبض المركب al-Nabḍu'l-Murakkab, Combined pulse Gr. συστηματικὶς or ἐν ἀθροισματι.

النبض الموجي al-Nabḍu'l-Maují, Undulating pulse Gr. κυματώδης σφυλμεγὸς κυματωδης (Galen. viii. 460).

النبض الغزالي al-Nabḍu'l-Ghizálí, Bounding pulse Gr. σφυλμεγὸς δυρκαδίζων σφυγμος (Galen. viii. 556).

النبض المنشاري Nabḍu'l-Minshárí, Pulsus Serratus Gr. σφυλμεγὸς ἐμπρίων (Galen. viii. 474).

النبض الدودي al-Nabḍu'l-Dúdí, Pulsus Vermiculans Gr. σφυλμεγὸς σκωληκίζων (Galen. viii. 460).

النبض النملي al-Nabḍu'l-Namlí, Pulsus formicans Gr. σφυλμεγὸς μυρμηκίζων (Galen. viii. 460).

نبض ذات الفأر Nabḍu Dháti'l-Fár, also called نبض ذنب الفار ; Sinking pulse Gr. σφυγμός μυρος (Galen. ix. p. 509).

النسمة al-Nasamat, Asthma.

النفس al-Nafs, Soul.

نفس الجسم Nafsu'l-Jism, Mind or Soul that controls the body.

نفس العين Nafsu'l-'Ayn. The Soul of the eye. i.e. Eye-sight.

النفس الحساسه al Nafsu'l-Ḥassáṣa, Sensation Gr. αἰσθητικὴ ψυχή.

النفس الحيوانية al-Nafsu'l-Ḥaywániyya, Animal Soul.

النفس النباتيه al-Nafsu'l-Nabátiyya, also called النفس النامیه Vegetable Soul.

النفس المحركة al-Nafsu'l-Muḥarrika, Motive or animating Soul.

النفس الفكرية al-Nafs'ul-Fikriyya. The rational Soul Gr. νοητικὴ ψυχή.

النفس الكلية al-Nafs'i-Kulliyya. The Universal Soul.

النفس al-Nafas, Breath. The following are the clinical classes of Breath.

ضيق النفس, asthma; ضعف النفس feebleness of breath;

عسر النفس, Dyspnoea, قصر النفس Shortness of breath;

استقامة النفس, استواء النفس, تتابع النفس, قوة النفس

النقرس al-Niqras, Gr. ποδάγρα gout.

النملة al-Namla, Herpes Gr. ἕρπης وهي تسعى كل قرحة لا تجاوز الجلد نسيما نملة (Göttingen. Arab. 99. f. 186a).

النوع al-Nau' (logic), Species Gr. εἶδον.

الوتر al-Watar, pl. الاوتار Tendon.

الوثي al-Wathí, Slight partial dislocation of an internal limb.

الوجود العددي al-Wujúdu'l-'Adadí, Numerical Existence.

الوجود الصوري al-Wujúdu'l-Ṣúrí, Formal Existence.

وجع الأنيثين Waj'u'l-Unthiayn, Disease of Scrotum Gr. πάθος ὀδχέον.

وجع الجنب Waj'u'l-Janb. See ذات الجنب.

وجع الريه Waj'u'l-Riya. See ذات الرية.

وجع الركبه Waj'u'l-Rukba, Pain in the knee, a kind of Rheumatism.

وجع المفاصل Waj'u'l-Mafáṣil, Pain in the Joints, Rheumatism Gr. ἄρθρων πόνοι.

وجع الورک Waj'u'l warak, Pain in the hipbone; a kind of Rheumatism. Gr. ἰσχιάδες ἰσχιάς νόσος.

عرق النسا, Sciatica; نقرس gout; وجع المفاصل, rheumatism, belong to the same class viz. the disease of the Joints. The difference between the three is this that نقرس is the disease of the joints of the feet, the ankles, and of the fingers, and specially of the thumb; عرق النسا affects the joints of the thigh; while وجع المفاصل is the disease of the remaining joints of the body. وجع الورک and وجع الرکبه therefore, (كامل الصناعة ج ١ ص ٣٩١ - ٣٩٢). apparently, come under وجع المفاصل.

وجع الكلية Waj'u'l-Kuliat, Kidney disease.

الوريد al-Warid, pl. اوردة also called ودج pl. اوداج Jugular Vein. It is also used in the sense of vein in general.

الوسواس al-Waswás, Insania.

الوضح al-Waḍaḥ, Leprosy.

الهيولى al-Hayúlá, Gr. ὕλη Matter.

الهيولى الاولى al-Hayúla'l-úlá, Primary Matter Gr. ἡ πρώτη ὕλη.

الهيولى الثانية المتجسمة al-Hayúla'l-Thániatu'l-Mutajassimat, Secondary bodily Matter.

الهيولى المركبة al-Hayúla'l-Murakkabat, Compound Matter.

الاشياء الهيولانية al-Ashyáu'l-Hayúlánia, Material objects Gr. τὰ ὑλικά.

الهذيان al-Hadhayán, Delirium Gr. παραφροσύνη.

اليافوخ al-yáfúkh, Sinsiput.

اليرقان al-Yarqán, Jaundice, Icterus.

اليرقان الاسود al-Yarqánu'l-Aswad, Icterus Niger.

يوم البحران Yaumu'l-Buḥrán, Critical day.

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